

'Philistine' policy on adults

by Charlotte Barry

The Government is forcing adult education to concentrate on work-related programmes in spite of rising unemployment, a London conference on community education was told.

This only heightens frustration and resentment by offering opportunities that lead nowhere, said Mr Peter Clynne, assistant education officer at the Inner London Education Authority and a member of the Advisory Council for Adult and Continuing Education.

Mr Clynne was speaking at a conference organised by the National Association of Teachers in Further and Higher Education and the Association for Adult and Continuing Education. In a blistering attack on the "philistine" attitude of central and local government to the education of adults he listed a catalogue of events caused

by spending cuts.

Some districts of the Workers' Educational Association were bankrupt with no future, and extra-mural departments of the universities were threatened by the latest Government cuts.

Local authority provision had been savaged up and down the country, fees raised dramatically and voluntary organisations being forced to cut back, Mr Clynne said. Community arts were under threat and adult education was being pushed into increasingly inappropriate and unacceptable times on broadcasting schedules.

The Government kept emphasising the educational needs of adults. "But Government pressure on local authority and university expenditure leads us to slash capital programmes, reduce building running and maintenance

costs and indeed sell educational buildings," he said.

The way to the future lay in more flexible and responsive ways of working with adults, Mr Clynne added. Adult educators must fit more into the life and work patterns of the individual and society, varying times and places, encouraging people to learn at work, use distance teaching and flexistudy.

"Ideas abound, examples of good practice are legion throughout the country. Given the existing financial and political commitment there is no reason why the 1980s should not be characterised by dynamic change and development," he said.

Community education workers should not exclude groups like the National Front from their work even if they find their aims and ideals distasteful, the conference was told.

Paul Flather reports on how a college is forced to re-examine its 144-year-old traditions.

Boyson's designs on the RCA



The Royal College of Art is facing one of the gravest tests in its 144-year history, a test that is putting its charter under strain, and forcing academic staff to rethink the college's views on collaborating with industry.

It has become clear in the last month that the Government is using all the pressure it can muster as paymaster of the RCA to try to switch the focus away from fine arts towards design management.

The crisis at the RCA, predicted first in the *THES* (March 7), has been building up ever since a Department of Education and Science visiting committee produced a highly critical report last summer.

The team noted that an internal development plan was being prepared by the rector, Professor Richard Guyatt, but were alarmed to find that few recommendations made by a previous visiting committee in 1978, were being adopted.

The committee urged immediate reforms with emphasis on more links with industry, and won support among a number of highly able lay members of the governing council, including Mr Cob Stenham, the chairman, and financial director of Unilever, and Mr Oliver Makover, a textile manufacturer.

The college was surprised at the severity of the report - in particular by criticism of its financial dealings - and by the implied threat to its long international reputation in fine arts.

As the months went by, Dr Rhodes Boyson, Under-Secretary for Higher Education, began to lose patience. On February 10 he wrote to Mr Stenham that he found it "particularly disturbing" that the DES committee had had to repeat and re-emphasize conclusions reached in 1978 and "that the college was not fulfilling its charter obligations to industry."

The charter, obtained in 1967 when Sir Robin Darwin, visionary tyrant headed the RCA from 1948 to 1971, described the aims of the college to "advance learning, knowledge and professional competence" in relation to fine arts and to industrial and commercial processes.

"Unless the college can be seen to be responding effectively to national needs and priorities, I fear the future may hold for it the prospect of fewer bursaries, falling student numbers, and corresponding less recurrent grant," Dr Boyson wrote.

It was only because of the RCA's potential in improving design throughout the industry that the Government was protecting its present grant, about £4.5m a year. "More and more this country needs good industrial designers," the letter urged.

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even submitting a dissenting paper to Dr Boyson, academic staff and students, conceding the need for some change, saw it more as blackmail.

In the midst of all this, there was a further complication, the search for a successor to Professor Guyatt who had always been seen as caretaker. Caught out in 1978, the college decided to hunt and drew up a long list of candidates.

In the end the college chose Professor Lionel March, an architect and design specialist from the Open University, who takes over in September. Soon after, six governors, including Mr Stenham and Mr Makover, resigned from the RCA.

When the rump council meets this week it will set about appointing replacements and planning a campaign to reverse flagging confidence of the college, and to respond to Dr Boyson.

Two planks of government policy are being exercised at the RCA - pushing higher education towards more vocational outlook and institutions towards a more "self-help" philosophy. As Dr Boyson likes to point out, another directly funded post-graduate research centre, the Cranfield Institute of Technology, raises 60 per cent of its income from research; the RCA raises barely 20.

Main findings in DES visiting team report:

AIMS: RCA has an important role to play in regeneration of industry, the "big claim" on revolutionising education is not justified. Students are not sufficiently well prepared for working life.

Links with industry: RCA must increase links, through a new short-course programme and students doing commissioned work, and gain access to specialised equipment like wind tunnels. Must collaborate with other institutions.

Commercial outlook: Must set up commercial office seeking design and research contracts, negotiating copyrights and royalties.

Funding: Must be more tightly controlled and imaginatively run with outside expert advice. New plans must be funded from generated income or better use of resources. Building extension of at least £4m at present in doubt.

Design Management: Awareness of this to permeate all departments, perhaps with new courses in business administration and "getting things done".

Research: Major growth in research needed with RCA exploiting its prime location and its role as a centre of excellence. Library to concentrate on design history.

The right course for polytechnics

The polytechnics should meet the challenge of continuing education by firmly aligning themselves with the further education colleges, Sunderland Polytechnic's acting deputy director told a conference in London.

This was essential if they were to survive economically and retain their identity with advanced further education, Dr Raymond Cowell told the Association of Vice-Principals of Colleges.

"If the further education sector will have us back in and if they will forgive us our defection of 10 years ago, then the polytechnics can make a real contribution to the emerging needs of continuing education students," he said.

Dr Cowell criticised preoccupation with the question of polytechnic status or university status. The idea that 10 polytechnics should be designated as universities was ridiculous and irrelevant to the task before them, he said.

"The polytechnics have gone through a decade of striving for academic credibility but there is a danger they might go over the top and see themselves as universities which is not what they are about," he said. "Now they have established academic respectability they could ossify into inertia."

"Instead of looking towards higher education as their model they should be looking again at further education. It is not only a challenge but a lifeline to the preservation of their identity."

Polytechnics had four specific qualities which gave them a solid base for developing continuing education: they were city centre institutions; they covered a comprehensive range of courses; they were market-oriented; and they were committed to curriculum innovation.

They were also in an ideal position because they had a tradition of providing part-time courses for mature students which outstripped the universities, Dr Cowell said.

But he stressed that the polytechnics must also be prepared to participate in exchange schemes with local industry and commerce, as recommended in a recent Government discussion paper.

Inspectors worried about Welsh cutbacks

Higher and further education in Wales is having difficulty in coping with spending cuts and controls, says the Welsh Inspectorate in a counterpart to last month's HMI report on education in England.

Although, with the exception of teacher training, enrolments have either been maintained or increased, the capping of the advanced further education pool has already led to some slimming down of course provision. Local authorities will have to make further economies in the sector in future, says the report.

Inspectors are most anxious about the state of non-advanced further education, where they found many eligible applicants unable to gain admission to vocational courses. The need is now paramount for careful planning to match the provision of courses more

effectively to the needs of students and employers, they say.

The severe levels of unemployment in Wales, together with the demands involved in industrial change, have created a widespread need for vocational courses, says the report. But such courses have only been mounted in some colleges at the expense of other provision, and with the aid of the Manpower Services Commission, while others have been unable to respond at all.

Adult education has also been hard hit, as authorities have reduced spending and increased fees by an average of the loss of 600 classes in one authority during 1978-79. In another the inspectorate found that adult education had virtually disappeared, except for a few GCE examination classes and

classes in Welsh as a second language.

Most Welsh authorities were found to have made economies, sometimes considerable, in part-time, evening and summer courses. Most colleges had suffered no significant reduction in full-time posts.

Restrictions on the provision of textbooks and stationery are said to have created difficulties in some colleges, but the report says that some institutions of higher education appear to have fairly substantial areas of under-utilised teaching accommodation.

The effects of the education cuts in Wales of recent local authority budget cuts are said to be "disastrous". The Welsh Office, Cathays Park, Cardiff, GFI 3NQ.

Lords voice fears on university cash cuts

by John O'Leary

Six past or present vice-chancellors joined a chorus of concern in the House of Lords last week on the fate of the universities after the latest round of Government spending cuts.

More than six hours of debate on the effects of declining expenditure concentrated largely on the plight of higher education but brought no hint of mitigation from ministers. Lord Belstead, the chief Government spokesman in the absence of Lady Young, insisted that resources would still be "by any standard very substantial indeed" and that quality could be maintained.

Echoing the words of Mr Mark Carlisle, the Secretary of State for Education, he called for ingenuity and a careful rethinking of priorities in higher education, altering the mix of students, staff, courses, buildings and equipment.

Lord Belstead was replying to a motion put down by Baroness David, Labour's education spokeswoman in the Lords, drawing attention to the damage done by cuts at every level of the education system. She accepted that some economies had to be made in further and higher education but was particularly critical of the treatment of public-sector institutions.

Lord Boyle (Con.), Vice-Chancellor of Leeds University - and former Tory Education Secretary - responded to Government claims that the science budget had been protected by pointing out that "a very high fraction" of science costs in universities were born through their dwindling recurrent budgets. There had been very great concern among vice-chancellors, he said, that the Prime Minister himself seemed unaware of this fact.

The former Vice-Chancellor of Edinburgh University, Lord Swann, detected a degree of unpopularity of the universities in the public mind, perhaps because they had failed to fulfil the unrealistic goals set for them in the 1960s. However, they remained among the best in the world and were inevitably expensive.

Economies might be made, he said, by cutting down on their complicated bureaucratic system, with "gigantic pyramids of committees, convocations, congregations, councils, faculties, boards of faculties, sub-boards of faculties, departments, departmental committees and a plethora of committees and a plethora of committees."

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tees on everything from catering to car parking, on which vast numbers of academics while away happy hours.

Lord Flowers, Rector of Imperial College, London, confirmed that increased overseas students' fees had resulted in a 35 per cent reduction in Imperial's overseas recruitment, which would mean a loss of at least £2.2m per year by 1984. Further cuts from the Expenditure White Paper would bring total losses to an annual figure of £4.6m, about 15 per cent of the college's total yearly income.

To meet the White Paper's implied targets, Imperial would need £2m over three years even if it could find the required number of voluntary early retirements. In practice, compulsory redundancies would be necessary, multiplying this figure several times, when even £1m would be difficult to find.

Lord Annan, Vice-Chancellor of the University of London, said the university as a whole could lose about £40m, or 20 per cent of its income, in three years. The £20m allocated by the Government for redundancies was totally inadequate, he said, and it was now certain that some sites in London would have to be evacuated entirely.

However, Lord Harris of High Cross, said he shed no tears for the vice-chancellors, who should turn their face to the market place and accept the need to publicise and justify their position. Buckingham, had done. Loans should be introduced, together with the option of intensive, two-year degree courses.

Lord Vaisey (Con.), too, thought that the universities had brought much of their present trouble on themselves, although it had also been a mistake to designate 30 polytechnics shortly after transferring the colleges of advanced technology to the university sector. Paper/teacher ratios were unnecessarily low and there was an urgent need for some mechanism to co-ordinate courses and look carefully at the allocation of resources.

Lord James of Rushmore, former Vice-Chancellor of York University, warned the Government to proceed carefully in cutting the university sector. The institutions had damaged their own case by "complaining far too loudly, far too often and quite frequently, unjustifiably" and some had sometimes abused their proper freedom. But shrinkage carried out quickly would be immensely expensive because of the existence of tenure.

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Four young Scots will be combining sporting careers with academic study after receiving the first bursaries awarded by Stirling University to aid further study, coaching and travel expenses. Left to right are: Ian Thomson, Stirling's director of physical recreation; Beverly Rose, a swimmer who will be studying business; Colin Dalgleish, a golfer who will study accountancy; Angela Bridgeman, an athlete who will study bio-chemistry; Susan Bell, a badminton player who will study history; and Robert Bonmont, the university secretary.

Race: regional policy needed

Regional planning is urgently needed to ensure that multicultural education becomes an established element of teacher training courses, according to recent evidence to the House of Commons race relations and immigration sub-committee.

Professor Maurice Craft of Nottingham School of Education says in written evidence that despite spending several million pounds on a large scale survey, compiling reports and having a major committee set up to assess the state of multicultural education and make recommendations, the return on the investment has been pathetically small.

"The depressing repetition of shortcomings in both initial and in-service teacher education cannot be ignored. It is an indictment not simply of central and local Government for failing to give a lead on race resources available, but also of teacher educators, course validators and schools for failing to respond more imaginatively and with a greater sense of urgency," he says.

"Among a list of proposals to improve 'the state of the art', Professor Craft recommends that the Department of Education and Science should take the initiative to ensure that a multicultural education element is developed in all initial teacher training courses."

"This should take account both of the continuing needs of ethnic minority children and also of the need to educate all children for life in a culturally plural society," he says.

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County council forces through redundancies at Hatfield

by Paul Flather and David Jobbins

Hatfield Polytechnic will be fighting for its survival if the county council continues to force cuts of 15 per cent over the next two years, warned its director, Sir Norman Lindopp, this week.

Hertfordshire education committee has confirmed a cut of 40 teaching posts and £698,000 savings at the polytechnic for 1981-82, as well as a £1m cut for 1982-83, despite a half-day strike and demonstration by members of the National Association of Teachers in Further and Higher Education.

"If we are asked to make cuts of over 15 per cent in the next two years, the polytechnic as we know it will cease to exist. We are right on the bone. The timescale is quite unrealistic," said Sir Norman.

Natfhe and Hertfordshire education officers are to begin talks shortly on a voluntary redundancy scheme. Natfhe is convinced compulsory redundancies will be needed to meet the council's timetable.

Compulsory redundancies at North East London Polytechnic will be avoided once more if governors take advice they are to receive from director Dr George Brosnan tonight.

Teaching staff have been faced with the prospect of up to 41 compulsory redundancies, with the burden falling most heavily on humanities, arts and social science departments, as part of an economy package.

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But Dr Brosnan, who has strongly pressed the need for axing staff in post to adapt the polytechnic to a new role designed for the 1980s and 1990s, appears to have had a change of heart.

In a paper to tonight's meeting he reports on consultations with the unions and says: "The governing body is formally advised that it is possible to meet the financial constraints without recourse to compulsory redundancy - a course of action he recommends 'with reservations'."

He will tell governors that he feels it is less clear that it is desirable to seek savings elsewhere to save jobs. "It is clear that short-term experience may prejudice long-term survival," he warns.

Already 100 lecturers have left since January 1980 and Dr Brosnan will indicate that staff are demonstrating flexibility and cooperation in ensuring continued operation and development of courses despite reduced resources. Almost 50 staff are taking advantage of a premature retirement compensation scheme.

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Youth plans woefully short

by Patricia Santinelli

The Manpower Services Commission is likely to ask the Government for a further major increase in the Youth Opportunities Programme by this summer at the latest because of a continuing sharp rise in youth unemployment which means that present allocation is already some 40,000 places short.

Regional plans indicate that at the most conservative estimate 483,000 places will be needed for 1981/82 instead of the present 440,000 to cope with the rise in unemployment.

Unemployment among school-leavers in February 1981 was 138 per cent higher than last year and vacancies notified to careers officers 80 per cent lower.

In a confidential report to the Special Programme Board, the commission points out that the position will probably only be clear by June.

"It is unlikely therefore that an approach to the Government now would lead to an immediate revision of the budget," the commission says. "Our objective should be to keep as many options open as possible and keep right on top of events so as to be able to decide whether additional funds are necessary and if so how much."

The commission has considered two ways it could deal with the current situation. It has rejected the idea of scaling down the plans across each region and for each element of the programme, on the grounds that this

would cause problems particularly in the case of putting on short training courses in colleges.

It has also decided against planning on the basis of 483,000 entrants on the grounds that financial resources might not be available to reach such a target with the result that in the summer they would have to restrict entrants to certain groups.

"The choice is not easy. Cuts made now will not be easily accepted by area boards which have increased their plans to deal with a rapidly deteriorating unemployment situation," the commission says. But it is also clear that the MSC cannot be seen to be planning on the basis of rapidly changing assessments of need, for which funds are not currently available and which may need to be revised upwards again in the next few months.

Instead the commission had decided to plan on the basis of 450,000 entrants which can be fitted within the present budget allocation. This could be reviewed in April and enable the SPB and the commission to go to ministers before the Parliamentary recess.

Computer staff lose out in pay stakes

by David Jobbins

Senior university computer staff are paid almost £2,000 a year less than their counterparts in other industries, an independent survey says.

The standing commission on pay comparability has reported that overall computer staff need a 14.7 per cent pay boost to bring them into line — despite a 13.5 per cent award last summer.

The commission has recommended that all computer staff except trainees should receive a 15.3 per cent increase backdated to last July; trainees should get a 10 per cent increase.

If implemented — the report is not binding — the recommendations would add £306,000 to the annual pay bill for 800 computer staff at the 42 universities covered by national negotiating machinery. Three universities, Oxford, Cambridge and the Open University, negotiate independently.

The greatest shortfall detected was for the relatively small number of chief operators and senior shift leaders. What the commission has done is to suggest that trainees should receive only the 10 per cent by which the minimum wage has risen. It then recommends that the remaining sum should be distributed among the other grades — equivalent to 15.3 per cent of the salary bill.

"We believe the method of distributing it is a matter for the parties," the commission says in its fifteenth and final report.

It would be in line with the study, carried out with the aid of the Pay Research Unit, if the operator grade (covering the largest group of computer staff) got a lower increase with a larger increase for the chief operator grade, the report says.

Existing pay scales range from £2715 for the most junior trainee to £6708 for a top-of-the-scale chief computer operator.

The PRU visited six universities and others were covered by survey. Only a handful of institutions said they were experiencing frequent or continual difficulty in recruiting staff — but those who did largely blamed inferior pay and conditions compared with opportunities for computer staff elsewhere.

But only one of the 18 non-university employers sampled in the survey and known to have had vacancies in the past year admitted even to frequent difficulty let alone anything more serious — and said this was due to shortage of suitable candidates rather than pay and conditions.

While the study found little difference in the work carried out in the universities and elsewhere, it pointed to a "very limited" opportunity for experienced university computer staff to progress beyond the higher grades.

"Though a solution will be hard to reach our comparisons appear to support the view that it would be advantageous and fair if some improvement in promotion opportunity were possible."

The commission sounded another warning note on the question of shift payments and the effect of a reduction as new technology is introduced on overall earnings.

The reference to the commission was made in May last year, and the date was later changed to July, when an interim 13.5 per cent award was made to computer staff. Other white collar university workers, who received the same interim award, have accepted a recommendation for a further 5 per cent.

The two sides meet to discuss the recommendations on April 1 with union officials suggesting they will seek an across-the-board payment rather than a more complicated distribution.

Europe plan aids overseas students

by John O'Leary

New moves have been made towards a common policy throughout Europe on overseas students, with tuition fees no higher than for home students.

Representatives of 23 European governments met for three days in Strasbourg and agreed a lengthy set of recommendations on the promotion of student mobility. They included a call for up to 10 per cent of places in higher education to be reserved for foreigners with selection on "essentially academic" criteria.

The final statement from the conference, which was organized by the Council for Cultural Co-operation,

said: "It would be desirable for the countries of Europe to adopt a common approach to the reception of foreign students as regards both teaching facilities and material conditions." However, it recognized that special problems in some countries would delay the implementation of agreed measures.

Although the delegates agreed that academic assessment was necessary to ensure that a student could cope with his or her course, they supported the establishment of bilateral agreements to give special aid to Third World countries. As far as possible, fees for all students would be equal.

The conference also called for a

working party to be established, comprising academic and government representatives, to "improve and harmonise statistics on foreign students." Member states were encouraged to work together in undertaking regular reviews of the effect of their policies on mobility.

The conference was called in recognition of the difficulties facing foreign students as a result of the unprecedented influx over the last decade. Although delegations were representative of the Council of Europe states, Finland and the Vatican, the recommendations of the conference are not binding.

Royal Society announces new fellows

At a meeting of the Royal Society last week, the following were elected Fellows:

Dr John Adair Barker: member of the research staff of International Business Machines, California, US, distinguished for his contributions to the statistical mechanics and thermodynamics of molecular systems, especially with reference to the liquid state.

Professor Eric Albert Barrer: rank professor of physiological biochemistry at the Imperial College of Science and Technology in the University of London, distinguished for his quantitative studies of acetylcholinesterase and the acetylcholine receptor.

Dr Fraser John Bergersen: chief research scientist in the division of plant industry at the Commonwealth Scientific and Industrial Research Organization, Canberra, Australia, distinguished for his physiological and biochemical studies of symbiotic nitrogen fixation in legumes.

Professor Peter Bradshaw: professor of experimental aerodynamics at the Imperial College of Science and Technology in the University of London, distinguished for his experimental and computational studies of turbulent flow in boundary layers in two and three dimensions and in supersonic flow, and of turbulence in jets and shear layers.

Dr David Maurice Brink: university lecturer in theoretical physics in the University of Oxford and Jovett Fellow and tutor in theoretical physics at Balliol College, Oxford, distinguished for his contributions to our understanding of nuclear structure and nuclear reactions, covering an unusually wide range of nuclear phenomena.

Dr Fred Brown: head of the biochemistry department at the Animal Virus Research Institute, Pirbright, Surrey, distinguished for his research on the molecular biology of viruses, particularly the foot and mouth disease virus.

Professor Ian Butterworth: professor of high energy physics and head of the department of physics at the Imperial College of Science and Technology in the University of London, distinguished for his contributions to our knowledge and understanding of meson and baryon spectroscopy, especially concerning the excited hyperon states.

Dr Brandon Carter: maître de recherche of the Centre National de la Recherche Scientifique, France, distinguished for his contributions to general relativity and astrophysics, particularly in relation to the theoretical analysis of black holes.

Dr Malcolm Roy Clarke: senior principal scientific officer at the Marine Biological Association of the United Kingdom, Plymouth, distinguished for his wide-ranging and major studies of the physiology, distribution and systematics of squid.

Professor Robert Norman Clayton: professor of chemistry in the University of Chicago, US, distinguished for his wide-ranging contributions to isotopic geochemistry, especially oxygen isotopes, and discoveries of isotopic heterogeneity in the Solar System and of a pre-solar component in meteorites.

Dr John Horton Conway: reader in pure mathematics in the University of Cambridge, distinguished for his highly original contributions to many branches of mathematics, notably the theory of finite simple groups and the theory of games.

Dr Rex Malcolm Chaplin Dawkins: deputy director and head of the department of biochemistry of the Agricultural Research Council Institute of Animal Physiology, Cambridge, distinguished for his studies on the structure and chemistry of membrane phospholipids and their metabolic interconversions.

Dr Dennis Frederick Evans: reader in inorganic chemistry at the Imperial College of Science and Technology in the University of London, distinguished for his contributions to chemistry through the application of techniques of magnetism, including nuclear magnetic resonance.

Mr Frank Reginald Farmer, OBE: formerly safety adviser to the United Kingdom Atomic Energy Authority, distinguished for his pioneering work, acknowledged worldwide, in the analysis of safety matters in industrial plants, especially in the nuclear industry.

Dr Norman Laurence Franklin, CBE: managing director of the National Nuclear Corporation Limited, distinguished for his contributions to the successful industrial development of techniques of enrichment, fuel fabrication and reprocessing in the nuclear energy industry.

Dr Christopher Forbes Graham: lecturer in the department of zoology at the University of Oxford, distinguished for his experimental work on mammalian embryos, especially in relation to the importance of the inside or outside position of early cells.

Dr Norman Michael Green: member of the scientific staff at the National Institute for Medical Research, London, distinguished for his studies of protein structure.

Professor Herbert Gutfreund: professor of physical biochemistry in the University of Bristol, distinguished for his applications of rapid reaction techniques to the identification of the intermediate steps in enzyme-catalysed reactions.

Dr Allan Stuart Hay: manager of the chemical laboratory, General Electric Research and Development Center, Schenectady, NY, US, distinguished for his discovery of the technique of polymerisation by oxidative coupling and especially the development of the commercially important Noryl group of thermoplastic resins.

Dr John McGregor Hill: chairman of British Nuclear Fuels Limited, formerly chairman of the United Kingdom Atomic Energy Authority, distinguished for his guidance and technological expertise as Chairman of the United Kingdom Atomic Energy Authority, in the organization of the nuclear energy industry.

Professor Kenneth Charles Holmes: director of the department of biophysics at the Max-Planck-Institut für Medizinische Forschung, Heidelberg, and professor of biophysics at Heidelberg University, Federal Republic of Germany, distinguished for his contributions to the development of methods for studying biological fibres by X-ray diffraction and his studies of Tobacco Mosaic Virus and muscle.

Professor Robert William Kerr: Honorary Fellow, Goldsmiths' professor and Head of the Department of Metallurgy in the University of Cambridge, distinguished for his work on thermal cycling, on dislocation interactions in single crystals and particularly on precipitation in "micro-alloyed" steels.

Professor Michael Rex Horne, OBE: Beyer professor of civil engineering in the University of Manchester, distinguished for his work on the plastic theory of structures, on instability, incremental collapse and shakedown phenomena, and on box girder design.

Professor Yuet Wai Kuan: professor of human genetics in the University of California, US, and director of the Howard Hughes Medical Institute Laboratories, San Francisco, US, distinguished for his analysis of globin gene polymorphisms in human populations, and of human disorders affecting haemoglobin synthesis.

Professor Robert Phelan Langlands: professor of mathematics at the Institute of Advanced Study, Princeton, New Jersey, US, distinguished for his contributions to the study of modular forms and algebraic number theory, notably by pioneering a new viewpoint now described as "Langlands' philosophy."

Dr Ian Alexander McGregor, CBE: formerly director of the Medical Research Council Laboratory, The Gambia, distinguished for his studies of the epidemiology of malaria in man, with particular reference to immune responses.

Dr John Ashworth Nelson: deputy chief scientific officer and head of the department of statistics at Rothamsted Experimental Station, Harpenden, distinguished for his theoretical work on experimental design and development of computer-based statistical programmes for interpretation of agricultural and biological data.

Professor Michael John O'Hara: professor of geology at the University College of Wales, Aberystwyth, distinguished for his researches in experimental petrology and silicate phase relations, especially concerning the genesis and evolution of basaltic liquids on the Earth and Moon.

Professor Astar Singh Palnait: professor of physiology and director of the Vaidya Patel Chest Institute of the University of Delhi, India, distinguished for his studies of the visceral receptors concerned with the control of the respiratory and cardiovascular systems, indigestion as well as in health.

Professor John Gwyn Phillips: Wolfson professor and director of the Wolfson Laboratory for Research in Gerontology in the University of Hull, distinguished for his pioneering studies on the endocrinology of salt and water balance in fish and birds.

Dr Edward Roy Pikel: deputy chief scientific officer at the Royal Signals and Radar Establishment, Malvern, Worcestershire, distinguished for his work in the field of statistical optical spectroscopy and its applications in physics, chemistry, biology and engineering.

Dr Walter Plowright, CMG: head of the department of microbiology at the Agricultural Research Council Institute for Research on Animal Diseases, Compton, Berkshire, distinguished for his work on the prevention of rinderpest and other viral diseases of African livestock.

Professor Kenneth Aloysius Pounds: professor of space physics in the University of Leicester, distinguished for his contributions to solar and cosmic X-ray astronomy.

Dr David Allan Rees: principal scientist at the University Research Colworth Laboratory, Bedfordshire, and associate director of the Medical Research Council Cell Biophysics Unit at King's College, London, distinguished for his contributions to the chemistry and biochemistry of naturally occurring carbohydrates and their practical applications.

Professor Colin Bernard Rees: Dunkley professor of chemistry at King's College in the University of London, distinguished for his studies of nucleotides and particularly for his development of the phosphotransfer approach to oligonucleotide synthesis.

Professor Edward Reich: professor of chemical biology at the Rockefeller University, New York City, US, distinguished for his studies of drugs interacting with nucleic acids, the acetylcholine receptor and tissue proteases.

Professor Wallace Leslie William Sargent: professor of astronomy at the California Institute of Technology, US, distinguished for his achievements in observational astronomy, particularly with respect to studies of Seyfert galaxies and quasars.

Professor John Clayton Taylor: professor of mathematical physics in the University of Cambridge, distinguished for his contributions to the quantum theory of fields and to the physics of elementary particles, especially concerning non-abelian gauge theories.

Professor David John Wheeler: professor of computer science in the University of Cambridge, distinguished for his major contributions to the design of digital computers.

North American news

Reagan freezes student grants

from Clive Cookson

WASHINGTON

The Reagan administration has stopped processing all applications for next year's student grants, while it waits for Congress to approve a new regulation that would make low-income families contribute more to college and university costs.

The freeze has infuriated student organizations, which claim that it has thrown the financial planning of hundreds of thousands of students into chaos. "It's causing a general uproar on our campuses," said Anne Ouchowski of the United States Student Association (USSA).

The regulation in question is somewhat technical. It would eliminate an automatic annual "cost of living" increase in the amount parents can deduct for essential living expenses when calculating their "discretionary family income". The latter is the basis on which the Education Department (ED) calculates a student's basic grant, if any.

Congress has 45 days to accept or reject the department's regulations. However Education Secretary Terrel Bell said he had asked members "to act on it promptly and not to take the full 45 days," so that the processing of grants could resume and applicants would be kept waiting for as short a time as possible.

Congress has not yet responded. Until it does, applications will remain on hold at the California computer firm, Systems Development Corporation, that has the government contract to process them.

The Education Department is send-



Mr Terrel Bell: call for action

postcards to about 1.5 million applicants for its basic grants — which were officially renamed Pell grants this year in honour of Senator Claiborne Pell, former chairman of the senate subcommittee on education. According to USSA the cards assure students that the delay is only temporary and nothing to hurry about.

The cards also ask applicants not to telephone ED with inquiries. However the student association is telling members that is exactly what they should do — call up the department "and let them know how you feel about the delay."

USSA legislative director Eduardo Wille says the association is even considering a mass mailing of its own, advising students to phone Washington

and complain. He recalls that three years ago when grants were held up the office of education, as it then was, was overwhelmed with calls from angry and worried students, its switchboards were jammed, and processing soon restarted.

Mr Wille says students are becoming very anxious about the current delay because April is the normal deadline for sending details of their financial circumstances to their campus financial aid office. The college cannot put together a financial assistance "package" of grants, loans and subsidized job without knowing how large its basic component, the Pell grant, will be.

The regulation that is causing all the fuss will save only a relatively modest \$180 a year, out of the government's total annual expenditure of \$2.5 billion on Pell grants. About 100,000 of the 2.8 million students who are currently eligible for grants would be eliminated from the programme, if Congress approved the change; most of them come from middle income families earning \$20,000 to 25,000 a year — the top of the eligibility range. Low income students would receive slightly smaller grants as a result, though the maximum would still be \$1,800 for those whose families are "truly needy," to use the favourite Reaganite phrase.

The Reagan administration is also proposing other, more significant cuts in Pell grants. One would raise the expected family contribution from the current 14 per cent to 20 per cent of "discretionary income". Another would impose a new \$750 self-help requirement that students must contribute themselves to their educational costs.

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Stanford pressed to invest in outside firms

Stanford University should consider taking a small financial stake in a wide variety of venture firms spawned by its faculty members, vice president William Massey told the Stanford committee on the university's future.

He suggested that a Stanford investment trust, operating with the university's own capital and outside donations, could make modest investments in new high-technology companies whose products were derived in some way from work at the university. It might also take shares instead of patent royalties.

However Dr Massey, who is vice president for business and finance, made clear that the university administration was still debating whether to engage in activities of these kinds. "We have resolved not to go and do anything prior to the conclusion of the debate and the decision," he said. "The issue is not settled."

University president Donald Kennedy warned in December that possible conflict of interest "command one to proceed with great caution to any level of involvement at which the

university has a directive role or an equity position, or both, in a corporation profiting from the results of faculty research."

In January Dr Kennedy, a biologist, told faculty members that three general principles would govern Stanford's commercialization of research discoveries: "First, and of supreme importance, we want to preserve the values of access and free exchange that characterize a vigorous academic society. Second, we are anxious to conduct ourselves in such a way as to bring the fruits of Stanford innovation into human service as rapidly as we responsibly can. Finally, we're disposed to be cautious in getting the institution involved in an equity position with respect to the products of faculty research because of the potential conflicts of interest such a position might generate."

The issue is now a major talking point at several research universities. Last autumn Harvard was embarrassed by the publicity focussed on its flirtation with the idea of taking a substantial

holding in a genetic engineering company being formed by molecular biology professor Mark Ptashne.

An interesting feature of Dr Massey's proposal is his suggestion that Stanford should try to invest in many ventures stemming from work done by faculty — perhaps even in all of them — so as to avoid charges of favoritism.

But he emphasized the need for safeguards. The university should always be a passive investor and must not attempt to influence the company's policy or operations, except when the firm was considering an action that would damage Stanford's vital interests.

Not everyone at the meeting relished Dr Massey's ideas. Professor Robert Mozley of the Stanford Linear Accelerator Centre called them "dangerous," and his colleague Edward Garvin said: "I'm disturbed about all of the talk of money. I think the temple is being taken over by the money lenders and money changers."

Motor industry slump hits state budget

by our North American editor

The University of Michigan and Michigan State University, two of the biggest and best public universities in the United States, are going through an agonizing process of contraction as a result of the state's current economic crisis. They are having to decide what academic programmes to eliminate and how many faculty members to dismiss.

Public higher education in Michigan has had to adjust to funding increases below the rate of inflation for most of the past ten years, so the universities were already financially strapped when the state legislature cut this year's higher education budget by about \$100 or 5 per cent.

Governor William Milliken still faces a state budget deficit of \$150m caused mainly by the decline of the car industry which has given Michigan around 14 per cent unemployment, the highest rate in the United States. So appropriations are likely to be cut further, at least in real terms, in 1981-82.

At Michigan State University in East Lansing the trustees have voted to declare an official state of financial emergency. This is an essential administrative prerequisite for dismissing tenured faculty members. However tenure is held so sacred in the US that professors will be made redundant, to use a British term, only as a last resort if all other economy measures fail.

Michigan State has to reduce its \$225m operating budget by \$20m in 1981/82. University president Cecil Mackey is recommending the trustees to eliminate the school of nursing, surely curtail the veterinary programme and reduce the funding of all other departments. Hundreds of clerical and administrative staff would be laid off.

The timing and extent of cuts in the academic staff have not yet been specified, but a spokesman said: "we are talking about a significant number of tenured faculty members eventually leaving the university." He added that the trustees would probably have decided on their retrenchment plan by mid-April.

Over the past two or three weeks there has been a flurry of protest demonstrations at East Lansing against the cuts. And the eight Michigan State trustees, who are elected in a statewide ballot, have been bombarded with phone calls opposing Mr Mackey's plans.

The scope for increasing revenues by raising tuition fees is limited, because Michigan State and the University of Michigan already charge undergraduate students from within the state \$1,360 a year, which is very high for a public university in the US each institution has an enrolment of about 45,000. Tuition went up 13 per cent this year, and, although there is bound to be another increase soon, it would not be politically feasible to raise fees enough to bail out either institution.

The new administration in Washington has made Michigan's officials even more nervous by proposing sharp restrictions on the general flow of federal funds into the state, as well as by cutting specific programmes.

Stanford man goes to Oxford

Merton College, Oxford, has elected David Saxon a visiting research fellow for the Michaelmas term 1981. The chairman of the UC board of regents, Joseph Moore, called the fellowship a significant honour both for David Saxon and for the University of California.

Mr Moore said it would give Dr Saxon an opportunity to get away from the daily demands of the university presidency and to refresh himself, Oxford, with its scholarly atmosphere, and Merton, as the oldest of Oxford's colleges, will provide the most ideal setting possible for reflection and careful contemplation of important issues facing higher education right now and in the foreseeable future.

Although Dr Saxon's academic background is in physics, he has inevitably lost touch with the experimental subject. A university spokeswoman said he hoped to do some work in physics, though not at a terribly technical level, but he also wanted to look at the administration of a very different type of academic institution.

Clive Cookson, North American Editor, The Times Higher Education Supplement, National Press Building, Room 541, Washington DC 20045. Telephone: (202) 638 6765

Remedial teaching effort dominates faculty

from Gene Maeroff

NEW YORK

Although Wolfgang R. Hirschberg, chairman of the German and Slavic languages department at City College, has a doctorate in Russian literature, he has not taught a course in the Russian language since 1977. His entire class load now consists of English as a second language for students in the institution's remedial education programme.

For Dr Hirschberg, who joined the faculty 22 years ago expecting to devote his academic career to teaching the Russian language, life changed abruptly with the university's open admissions policy and the rising course requirements of the 1970s.

Now he is one hundreds of faculty members at City College and the other 17 units of the City University involved in a remedial education effort so vast

that more than half of the university's 33,000 freshmen take at least one of the courses. Of all the institution's courses, 17 per cent fall in one of the remedial categories.

Some of the City University's newer faculty members have been hired specifically to teach remedial courses, but others have been assigned to the courses because they were in effect marooned in their fields. This has happened as students, no longer required to take courses in such disciplines as history, philosophy and foreign languages, have increasingly turned toward fields that will increase their chances for jobs.

"For us tenured people in fields in which there is no longer a demand, there comes a day when the college says: 'That's it,' said Dr Hirschberg, "and you're out of a job. It's a question I avoid, he answered carefully. "Of course, it is to see experience basically going to pot and

not being developed further, but there are certain developments in modern life, and why should professors be exempt? To insist that certain things do not touch me is to be unrealistic."

Dr Hirschberg has not simply been touched by remedial education, he has been immersed in it. Students' dwindling interest in foreign languages has put five of the seven members of his department partly or fully in the teachings of English as a second language; much work now consumes 40 per cent of the time of those listed in the catalogue as the faculty of German and Slavic languages.

New York Times News Service

Overseas news

Worry over Rhodes sentences

from Craig Charney

JOHANNESBURG
A white university lecturer, Guy Berger, 24, was a lecturer in the Rhodes Department of Journalism, Pillay, 28, was a student in the sociology department.
They were convicted on the evidence of two security policemen who had infiltrated left-wing student movements in South Africa.
Among the offences for which they were charged was organising reading groups among Rhodes University students, though many of the books read, such as Marx's *Capital*, are not banned in South Africa.
As a result academics and students here have expressed fears about academic freedom at South African universities.
At a student mass meeting at Johannesburg's Witwatersrand University, sociology lecturer Eddie Webster said the effect of cases like the Berger-Pillay trial was to circumscribe the range of

trade union ally of the ANC. Sentencing was postponed until today.
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At a student mass meeting at Johannesburg's Witwatersrand University, sociology lecturer Eddie Webster said the effect of cases like the Berger-Pillay trial was to circumscribe the range of

issues students and lecturers felt free to explore. He also warned that the infiltration of the university community by p.o. spies damaged the delicate relationship of confidence between student and teacher.
At the same meeting George Bizos, as attorney who has acted in several political trials, warned: "Ideas can hardly flourish in a society where organisations are declared unlawful, the individual is punished without an opportunity to defend himself, and when he can, is charged under widely defined crimes."
The line between what is prohibited and what is allowed has become blurred. This makes it often difficult to decide who is guilty and who is innocent in view of these wide definitions.
At the meeting the 288 students present passed a resolution condemning "Trials of ideas" such as the Berger-Pillay case.

Professor urges creation of Arab-Islam science alliance

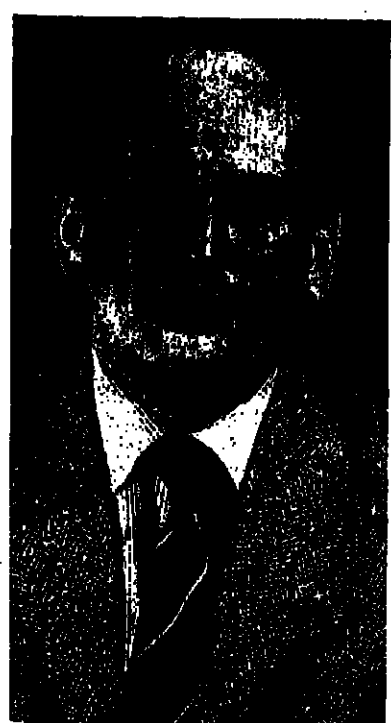
by Patricia Santinelli

An urgent call for the creation of a scientific commonwealth of Arab and Islamic Nations has come from a leading physicist, Professor Abdus Salam, the 1979 Nobel Prize Winner in Physics.
Speaking at a symposium on "Arab Endogenous Intellectual Creativity" organised by the United Nations University and Kuwait University, Professor Salam who heads the International Centre for Theoretical Physics in Trieste and is professor of theoretical physics at Imperial College, London, appealed to academics, scientists and Government officials to enable Islam to lead the world in science again.
Professor Salam said that the renaissance of sciences within Islam and Arab countries depended on five main conditions: commitment, generous patronage, provision of security, self-governance and internationalisation of our scientific enterprises.
"Therefore one of the first steps will be for our societies and in particular our youth to have a passionate commitment to such a development," he said. "Moreover our governments will have to impart hard scientific training to more than half of their manpower and they must pursue basic and applied sciences with one to two per cent of their GNP spent on research and development alone."
Professor Salam added that scientists should assume they would be given all the resources they needed in pure and applied science, that their researchers would be used and that they would be granted self-governance and involvement in their societies and developments which so far had escaped them.
Full conference report, page 8.

Trinity College's new provost declares his priorities

from John Walshe

DUBLIN
Better State funding for universities, maintenance of high standards of teaching and research, and improved internal communications are the main priorities for the new Provost of Trinity College, Dublin, Prof. W.A. Watts.
Prof. Watts takes over the provostship of Ireland's oldest university (founded in 1392) at the end of September. He replaces Dr. F.S.L. Lyons who is retiring three years early, mainly to devote more time to research and to complete the authorised biography of W.B. Yeats.
Prof. Watts, a Dubliner, was born in 1930. He lectured in Hull before returning to his alma mater in 1955. Last year he was appointed to a personal chair of quaternary ecology.
There were five candidates for the post of provost, and Prof. Watts had a resounding win in the vote of an electoral college comprising about 370 academic staff and nine students. His appointment was formally made by the Government; before the foundation of the State, it was a British Crown appointment.
Prof. Watts has made it clear that he wants to put the university case for better financing more forcibly. "By EEC standards, universities in Ireland are poorly supported," he says. "The next provost should devote his best skills in negotiation, persuasion and social contact to presenting the university case, especially to the public service and semi-state bodies which control our funding."
He has also reaffirmed his commitment to the achievement of high standards in research and teaching as Trinity's most important function.
Lack of effective communication between departments and the central



Professor Watts: high aims

Le Havre achieves university status

from Guy Neave

The start of next academic year will see the town of Le Havre elevated to university status. Following a vote by the National Council for Higher Education and Research, a narrow majority of 42 to 38 approved this latest proposal by the minister of higher education, Mme Alice Saumier-Silf.
Le Havre will be the first new university created since 1973, when the technological university of Compiègne was set up.
Even before the principal has been nominated, the new university has been the object of considerable political and fighting, controversy and backbiting. No sooner had the news broken that the minister's proposal had gained the backing of the national council than local representatives from Le Havre, where the Communist Party is particularly strong in the town hall, were on their way to Paris brandishing protests. The minister it is claimed, did not consult them before acting.
The new institute is to be governed by a different legal statute than most other French universities. In the first place, its principal is to be nominated directly by the minister for a period of five years, rather than being elected by

Commission lets Gierke keep his degree

Edward Gierke, the former Polish Party leader is fully entitled to his MSc degree, a special commission of the Krakow Academy of Mining and Metallurgy has decided. The commission was set up to investigate charges from the Academy's "Solidarity" branch, alleging that high party and government officials were the only people to have been able to take advantage of special engineering courses set up from time to time.

The fact that the new university will concentrate on graduate courses will, it is feared, attract many students away from the 13,000-strong University of Rouen. The latter faces the prospect of becoming a glorified version of "an open door college" on the American model. This possibility is more than likely if the new technology based courses, thought to be already in the pipeline, are validated for Le Havre and particularly so if Le Havre is given the go ahead to develop doctoral level studies.
The curious aspect of this episode is not that Le Havre has been opposed to the idea of a university in its midst. Quite the contrary, local councillors in Le Havre have been agitating on and off for the last 10 years to have the higher education facilities in their town extended.
What is, however, near miraculous the speed with which the decision was taken. Rumour mongers insist that the case with which Antoine Rufenacht, right wing deputy for the Seine-Maritime, managed to win over Pierre Raymond Barre to the idea of a new university in his constituency is not entirely unconnected with the services Monsieur Rufenacht rendered to the Minister of higher education late one night in December 1979.
In a late night session, sparsely attended, in the chamber of deputies, Mr Rufenacht inserted an amendment altering the right of students to participate in electing university presidents. This not only changed profoundly the provisions of the 1968 guideline law. As the presidential elections approach, Le Havre seems reluctantly to have benefited from the usual distribution of manna and grails that are apt to fall in seasons such as these.

Bi-national college rejected

by Enil Zubryn

The Mexican Ministry of Education has rejected a proposal by the California Commission (a joint organization including the governments of California, the US and the state of California) to create a bi-national college with the participation of Mexico and the United States.
The idea of the project was to have the college a part of all universities and schools of higher learning (including private) in Mexico. The goal being to train the future political leaders, as well as directors and assistant directors of several Mexican industries to insure the economic stability of both parties.

Identities of the Binational College are "contrary" to Mexican national interests. This despite the fact that one of the objectives of the college was to create a special force of academicians from both countries to engage in broad research programmes of common interest, such as the petroleum industry as one example.
Proponents for the college in the United States, and including Baja California's governor, Roberto de la Madrid, had argued that the proposed school would be the key for a growing inter-dependence and cooperation between the two countries, in which socio-economic problems require the use of the best academic talent. The programmes envisaged covered technical education, training projects, development of training programmes for farmers and livestock producers, the fishing industry, and the entire indus-

trial complex. There was to have been an exchange of scholarships; the development of an "information bank," computerized, for more efficient research; and the establishment of a pool of highly trained professors who would be interchanged in colleges and universities of both nations.
The project, rejected by the Mexican government, had the full support of American ambassador Julian Nava, Senator Jacob Javits, and the Mexican assistant, departmental head of the Ministry of Education's division of higher education and scientific research, Eliseo Mendoza-Bernuete. For the Bi-National College, said the project would have been financed with an initial fund of \$34,000 for the first year, with a rapid increase in financial aid as the programme expanded.

Heavy fall in number of university applications

from James Hutchinson

Although the number of students in West Germany continues to rise, the proportion of people with the *Abitur*, roughly the equivalent of A levels, who wish to study has fallen heavily in the past 10 years. Last year only about 65 per cent were seeking university places, compared with 98 per cent in 1972.
The test are anxious to start their careers immediately, but preferably in jobs which offer training for senior grades. Many school leavers say they want quick financial independence, and a lot are deterred from going to university by forecasts that Germany will produce a "graduate" proletariat.

Zimbabwe's ambitious expansion

Stephen Taylor concludes his two-part report from Salisbury

The responsibility for carrying through Zimbabwe's drive for education, one of the most ambitious to be undertaken by an emergent nation, has fallen squarely on a new teaching establishment that the government is attempting to fashion with few resources and in the shortest time.
Since independence, primary school education has been made free and this year secondary schools were opened for the first time to all who qualified for a place. As a result, the school population has more than doubled in less than a year, creating an unprecedented demand for teachers.

Advertising campaigns abroad have attracted a number of teachers from Britain and Australia and there has also been a return to the country of qualified Zimbabwean teachers who lived abroad during the civil war.
But the bulk of the new educators are to be provided by a remarkable concept in teacher training that was devised in Maputo when those who lead the country were a movement in exile.

The Zimbabwe integrated national teacher education course (Zintec), which started earlier this year, is designed to produce qualified teachers through a combination of intensive courses and correspondence study while teaching.
There are three Zintec centres, Nanyang in Umtali, Morgan in Salisbury and Morgenster in Port Victoria, with plans for a fourth at Bulawayo. A total of 607 trainee teachers have started work at the three centres on the first of two 17-week courses. When they have finished the first they will be assigned to a primary school in the rural areas.

In this way three groups of about 600 potential teachers will pass out of the Zintec centres each year. While teaching they will continue to study through correspondence and will return to the centres for further training in alternate holiday periods, after a final 17-week course at the end of the fourth year, the trainees, who will have spent about two and a half years holding down full time jobs, will be awarded teaching certificates.

The Ministry of Education has ruled that students with O levels can apply for Zintec places but must upgrade their qualifications before they start their studies.

Mr Dzingirai Mutumbuka, the minister of education, set the tone of the project in an address to Zintec lecturers in January. "The task before you is a difficult one," he said. "We expect you to work doubly hard in the earlier years of independence... these early years must of necessity be years of relentless struggle when all of you will be over-worked."

In addition to the teachers produced by Zintec there are about 3,200 teacher trainees at four government and four private training colleges. The majority of the trainees are in the first year of a three-year course. About 300 teachers are expected to obtain certificates from the eight colleges this year.

A further teacher training college, with a capacity of about 200 is due to open this month.

There are two polytechnic colleges in Zimbabwe, one in Salisbury and one in Bulawayo, offering mainly courses in business studies and technical skills. The importance that the government attaches to the polytechnic is indicated by the fact that they have been transferred from the patronage of the Ministry of Education to the Ministry of Manpower, planning and development. But there is little sign yet of the introduction of the sort of courses needed to overcome the drain of technical skills from the country. In part that is due to the fact that a number of teaching staff have left.

The colleges report there has been a substantial increase in enrolment by black students this year.

Social democracy and the universities

Peter Scott looks for pointers on the higher education priorities of the Social Democrats, and finds evidence of likely ambiguity

Among its earliest supporters and now avowed supporters in the House of Lords are Lord Flowers, rector of Imperial College, a former chairman of the Science Research Council, and still one of the powerful figures in science policy in Britain; Lord Perry, the Open University's founding vice-chancellor who retired last year, and arguably the man who has done most to extend higher education opportunities since Lord Robbins; and Lord Evers, former vice-chancellor of Oxford, historian, and biographer (among many others of Ernest Bevin).

Outside the Lords support for the social democrats among academics runs wide and deep. Sir Frederick Dainton, former chairman of the University Grants Committee and now chairman of the British Library, Sir Charles Carter, former vice-chancellor of Lancaster and the *eminent* *grise* behind the new Policy Studies Institute, Professor Norman MacKenzie, historian of the early Fabians, Michael Young, the sociologist, Michael Zander, the radical law professor. The list can be extended almost indefinitely, and certainly will be as more academics unasily perched in the right of the Labour Party peel off to join the social democrats through the summer.

So it is a fair expectation that if the social democrats have detailed policies – and it is too early to expect too much – they should have a policy on what so many of them know best, higher education. This expectation is reinforced by two further facts: the greatest practical, as opposed to intellectual, achievements of Anthony Crosland (despite the protests of his widow and the direction of his own political life in the years immediately before his death still the household god of the social

democrats) were made during his two years as Secretary of State for Education; and the Cabinet experience of Mrs Shirley Williams, certainly the most personable of the council's leadership quartet, was in the same post.
The council, of course, has not yet issued any policy statement apart from the celebrated *Umbro* declaration which dealt inevitably in generality – what is wrong with Britain, and how it can be put right. But two of the leading figures in the CSD have recently written books which equally inevitably are being read as draft manifestos for the new party. David Owen's *Face the Future* published last month, and Shirley Williams' *Politics is for People*, which will be published shortly by Penguins. Taking these two books together with the public statements and position of other social democrats supporters on higher education, some attempt can be made to map out the broad outline of their likely policy.

What emerges, however, is a very fuzzy outline indeed, even on the fundamental question of the appropriate level of public expenditure. Mrs Williams states bluntly: "Even if new taxes were to be introduced, and if public expenditure could be got back to 44 or 45 per cent of gross domestic product or even more, the finance for major improvements in the social services is not going to be available this side of much higher growth."
In his book Dr Owen specifically rejects, although with some regret, the arguments of the conservationists for a no-growth strategy, but he too links higher public spending with faster

economic growth. The difference between him and Mrs Williams is that he seems more confident that faster growth can actually be achieved. Both, however, agree in rejecting the monetarist objections to public expenditure favoured by the present Government. So it is probably a safe, although not a cast iron, assumption that a social democrat-led Government would be much more expansionist in its expenditure policies.

More tension might develop between social democrats on how any increased spending on higher education should be shared out. Support among academics for the CSD appears to be concentrated very much at the university end of the spectrum. This suggests a commitment to preserving excellence and, if money is short, rationalization of resources to achieve this object. Lord Flowers, for example, is a robust advocate of rationalization within London University and Sir Frederick Dainton during his time at the UGC nudged the committee in a *dirigiste* direction. On this evidence "to him that hath shall be given" might be the guiding principle of a social democratic policy for higher education.

But the views of the political leadership of the CSD seem at variance with this priority among their most influential supporters. Mrs Williams, for example, writes of "formal higher education (being) succoured with very high staff-student ratios... and reasonably generous financing," and contrasts this with the poverty of adult education. Dr Owen, too, places great emphasis on vocational training as a

social democratic priority and specifically states that far too much emphasis is placed on initial rather than mid-career education.
However, the most obvious split among the social democrats is on the question of how higher education should be organized and administered. On the one hand is a strong commitment to decentralisation of power, most evident in Dr Owen who refers to the UGC as "a manifestation of corporatism" and argues for a formidable extension of local authority powers; on the other hand an equally strong practice of centralism, most prominently during Mrs Williams' time at the DES when corporatism (such as the Oakes proposals for the polytechnics and colleges) seemed very much in favour.

So the overall impression is one of ambiguity. A social democratic policy for higher education might favour the mild expansion of an essentially elitist system accompanied by a new priority for adult education (the Williams variant), or equally well a radically decentralised and heterogeneous system of continuing education in which academic higher education had a lower priority (the Owen variant).

Some may regard such ambiguity as evidence of the endemic ambivalence of social democracy at an intellectual level and of its opportunism at a political level. Others simply as a further sign that many academics, particularly in universities, are not very interested in higher education. To be fair, it is probably simply a symptom of the fact that the really important choices in higher education remain undebated and even unrecognized. After all, if the Labour and Conservative Parties have found it too difficult to evolve a coherent strategy for higher education, the embryonic social democrats can hardly be expected to have done better.

David Owen *Face the Future*, Jonathan Cape £12.50 Shirley Williams *Politics is for people*, Penguin £2.50

The acceptable face of DES linkage

In the turmoil surrounding the possible loss of local authority influence in higher education, it is easy to forget that almost a third of the institutions earmarked for coverage by the national body already experience direct funding.

For the 24 voluntary colleges and seven direct grant institutions included in the Department of Education and Science's proposals, the issues are very different to those which have featured in the public debate. Ironically, while others shrink from "nationalisation", the two groups' main worries concern the consequences of less immediate links with the DES.

Whatever others may say about the Department, the colleges have few complaints. Indeed, the Association of Voluntary Colleges told the Select Committee on Education: "Relationships with representatives of the DES have been excellent throughout, with evidence of their complete understanding of the roles and needs of the colleges."

The Association went on to say that it would favour a continuation of the present system of funding, which sees more than 75 per cent of income derived from the DES, but the colleges would not wish to be isolated from a national body, if one were to be established.

This conclusion emerged from talks with DES officials on the body envisaged by the Oakes Committee and is likely to hold good for the current exercise, as long as certain safeguards can be incorporated into the final version. The voluntary college principals were meeting this week to determine their attitude in detail.

The colleges, which are autonomous institutions run under the aegis of charitable trusts or limited companies, have enjoyed their present relationship with DES since 1966, when they ceased to be denominational institutions. They vary, the oldest dating back to long in the last century, and have only a preponderance of teacher training common to all.



In our continuing series on the Government's plan for a national body John O'Leary and Ngaio Crequer look at the direct-grant colleges and their practical experience of central funding by the DES

While they were sympathetic to the Oakes proposals, which would have given the colleges special arrangements, many of the principals are much more wary of the new plans for a national body. They fear that they could be swamped by the larger numbers of former local authority institutions and no longer receive such immediate and sympathetic treatment.

At present, they have unparalleled access to senior civil servants precisely because of their direct funding relationship. In a national body serviced independently this would inevitably disappear, as would the theoretical avenue of appeal to the Secretary of State for Education. Although this is not a serious loss in itself, it does allow the churches to use their formidable lobbying power to apply Parliamentary pressure when needs be.

If the national body does come into existence, the voluntary colleges will argue strongly for continued funding should have little to fear from nationalisation, as long as the DES is not run for the cheapest sector of higher education. Nevertheless, as one principal put it: "The plankton in the water might be richer but there will be some mighty big whales about."

At least the colleges should suffer marginally less upheaval if a change of funding does come. Whereas the local authority institutions' property would have to be bought out and new trusts set up to administer them, there would be no need to do likewise with the voluntary colleges. Any plans to do so would meet determined resistance from the churches.
The seven directly funded colleges together account for about 2,200 full-time equivalent students, and 76 per cent of their work is at an advanced level.
The seven are: three agricultural colleges: Seale-Hayne at Newton Abbot, Devon; Shuttleworth: Agricultural College in Biggleswade, Bedfordshire; and Harper Adams Agricultural College in Biggleswade, Bedfordshire. The Royal Academy of Music, the Royal College of Music and Trinity College of Music.

There has of course been no consultation between the Department of Education and Science and the colleges, and consequently no discussion within them as to whether, or not they would welcome joining a new national body.

But most appear to be happy with their present relationship with the Department. The three agricultural colleges already work closely together both formally and informally, and operate on a similar financial basis. Shuttleworth has 150 full-time students in residence and a further 70 undertaking a middle year of sandwich courses. It offers higher and ordinary national diploma courses plus certificate courses for farmers' sons and daughters.

The Royal College of Music in London has about 600 students, mainly training in performance, but about 45 are graduates planning to become teachers. All the courses are full-time and the basic length is three years plus one advanced year. The college gets a 'substantial' proportion of its income from the DES.

The Royal College of Music gets two-thirds of its running costs through deficiency grant aid from the DES which makes up agreed loss retrospectively. The college has about 580 students and runs two first degree courses, a number of postgraduate courses and a four year diploma course.

Trinity College has about 400 full-time students and offers a course for graduates, performers and prospective teachers.

Few would disagree that unemployment has replaced income distribution as the principal social issue of Britain in the 1980s. This marked shift in emphasis has been mirrored on a different scale by the work of the Centre for Labour Economics at the London School of Economics.

The centre's brief history reflects an impeccable sense of timing. Its present head Professor Richard Layard, was senior research officer for the Robbins committee on higher education in the early 1960s. At Sir Claus Moser at the LSE, together they set up the Unit for Economic and Statistical Studies on Higher Education in 1964.

Ten years later this evolved into the Centre for Labour Economics when Professor Layard was joined by Professor Stephen Nickell. Both he and another newcomer to the centre, Professor David Metcalf, who has retained his base at Kent University, had never worked on education. They were more concerned with wage structure and the demand for labour.

Professor Layard explained: "These things were not completely accidental, we became interested because of the issues at the time. Education was a major thing in the 1960s, when the question of the economics of education had become a much more central issue. In the same way the big issue of the 1970s was income distribution and we are now moving towards unemployment which is the major thing of this decade."

The importance of this subject was recognized last year when the centre beat more than 100 competitors to become one of the Social Science Research Council's five designated research centres.

Since 1974 the centre has been slowly building up a reputation for its microeconomic studies of how the British labour market works, using a mixture of new data resources and econometric analysis.

Its initial work on income distribution included the main issues of what determines individual earnings and how taxes and benefits affect the labour supply.

In particular over the past few years the centre has been a prolific source of published material. Its discussion paper series provides at least a dozen major journal articles a year and individual members have written or contributed to a growing combined list of books.

A grant from the Ford Foundation for a UK/US economics of education exchange programme has financed four conferences and the same number of academic exchanges. The centre has also been associated with three conference volumes, all of which made special journal issues, devoted to unemployment (Journal of Political Economy), unemployment (Economic Journal), and collective choice in education (Public Choice).

Members of the centre act as advisers to Government departments and have given evidence to the House of Lords committee on unemployment. Their biggest study on poverty formed influential evidence to the Royal Commission on the distribution of income and wealth and was the core of the book *The Causes of Poverty* published by Richard Layard, David Pichaud and Mark Stewart.

Now the centre intends to expand the kind of microeconomic studies it is very good at, looking at the problems of particular groups such as the young, the unskilled and women. As well as the unemployed it will also look at labour demand and supply, and wage structures and incentives particularly as they affect the work behaviour of married women.

It is also setting itself the more ambitious task of trying to understand what has gone wrong. Why is unemployment so high and what can be done about it? Why are labour markets so slack throughout Europe? This will bring the centre for the first time into the main issues of macroeconomics and the relationship between inflation and unemployment, which it views with high trepidation.

A demand and supply study of employment



Swings and roundabouts of unemployment

Unlike many of the research centres attached to universities, the Centre for Labour Economics has nine part-time senior research staff most of whom are academics in the LSE economics department.

The junior research staff, who are restricted to a three year contract, are mostly PhD students paid for by project grants. More often than not they are recruited from the economic department's MSc course.

Professor Layard approves of this arrangement. "If you have senior full-time researchers up to a point they feel senior class citizens. If the junior people are not doing PhDs they feel like slaves."

"The morale here is terrific because everyone has a stake in what they are doing. Everyone is interested in what everyone else is doing and people help each other with computing and econometric problems," he says.

Professor Layard is a deceptively quiet man with a persuasive manner who originally read history at King's College, Cambridge. Although ostensibly part time head of the centre, he sees himself

as increasingly part of it. "When I started here I converted to economics from history. I originally thought of myself as a full time teacher and wrote a textbook on microeconomics. But I feel now that research is my chief concern."

This does not mean that he now avoids teaching altogether. He and his colleagues teach options on the MSc courses in the LSE. At the same time they have built in provision for one six months sabbatical a year which helps keep research projects going during the university term.

There are fortnightly seminars attended by both academics and civil servants and a summer institute on unemployment will include distinguished American visitors as well as British economists.

As a designated research centre, it now has guaranteed funds of between £30,000 and £100,000 a year for the next eight years. Its new status means it now has flexibility to quickly follow up important new projects.

It will also help the centre to recruit the best candidates exactly when it needs them. Traditionally the centre has never had any difficulty in recruiting good research staff, but has sometimes had to turn them away because the money came too late.

"Good research is the marrying of a good idea with the right person plus money, but you can't always get these things together. Some of these young people are incredibly bright and now we can snap them up as they come along," said Professor Layard.

Although the work of the centre has not gone unnoticed in Whitehall, like so many microeconomic research teams it lacks the influence of the major macroeconomic modelling groups.

However Professor Layard and other individuals there have made the occasional foray into the world of policy making and out of a number of specific policy proposals one was adopted in 1978 by the Labour Government. The centre's idea was to have a subsidy for firms which supplied extra jobs for unemployed workers.

"I created an enormous amount of interest in Whitehall, though it was not taken up in a very great way. The small firms employment subsidy was going to become quite important if Labour had won the election," he remembers.

Central to the centre's approach is a permanent incomes policy which would be used to fight inflation. Based on an idea put forward by Professor Abba de Mello, State University of New York, it involves a Government-imposed pay restraint. Any firm which wanted to go over the barrier would have to buy a licence or permit to do so.

But members of the centre have had to face up to the fact that these ideas on detailed labour market policies would be far more acceptable in a Labour Government than the present one. At the moment it is a question of contributing individually to public debate and hoping to influence politicians in an unobtrusive way through reasoned argument.

Changing the system from the inside

Paul Flather looks at the issues facing next week's NUS conference

Students have entered the 1980s suspicious of politics; cynical about parties and spending more time checking books in and out of libraries than building political power bases at meetings and in committee rooms.

If Herbert Marcuse, the guru of the May '68 events, was still around in the bleak 1980s he would have to amend his theories. No longer could he write of the student movement as the unadorned hope for the new society.

No longer are students on the outside of the political process, capable of revolutionary new energy, but on the inside, he would say. This new image should be confirmed when 1,000 delegates of the National Union of Students gather in the Winter Gardens in Blackpool next week for their twice-yearly conference. They will come armed with pocket calculators to work out the new grant percentages and the transfer of votes, not with political tracts.

External and internal pressures have forced them to work within the system, lobbying MPs and college authorities, producing briefing documents and prepared statements rather than campaigning on the streets outside. First has been the pressure to economise as grants have fallen in real terms and costs risen. Nationally this led to the so-called priorities review, turning NUS into group dealing with mainly its members' interests in the manner of trade unions.

Secondly the rapid shrinkage of the job market with one in five university graduates facing the dole next year according to recent forecasts means

higher education is no longer a passport to prosperity. No one, but no one, thinks about jobs in academe, a major change in attitude during the last ten years. Indeed thousands of dons could themselves lose jobs soon.

Thirdly, the new national mood that everything must be earned by work and by hardship. This was what swept the Conservatives to power, and whatever residue the Budget has left, this "tighten our belts" and "we cannot live beyond our means" philosophy is still in the ascendant, among students as with other groups. Coupled with this is the kick towards wealth creation that Dr Rhodes Boyson, under secretary for higher education has given the sector.

Heading the transition into the 1980s was Trevor Phillips, former NUS president, who described the 1970s as the decade "when the bubble burst". And David Aaronovitch, current president. As with all transitions there are those who hanker after the days when things were outside and militant. At Blackpool these two roles will be played out by the Left Alliance (LA), and the National Organisation of Labour Students (NOLS).

The Left Alliance of Communists, Labour and Liberals, successor to the Broad Left, was set up to make student politics more representative and less tied to far left orthodoxy. For that it has been the pressure to economise only individuals and not political parties could sign up. For four years it has held its own dominating student politics, although this year it has not held a majority on the NUS

executive. If this conference is about any central theme it is about the future of the Left Alliance, held together by a simple statement of aims, little structure, and organization, and no secretariat. From the left flank it will be attacked by NOLS, who are running a serious rival for the presidency in Helen Connor, current NUS treasurer.

NOLS has been trying to build a distinct image in student politics for some years. It is a child of the early 1970s and never swallowed the priorities review or the grounds that students were turning the clock back to the days they were "unaware". As Ms Connor writes in her manifesto: "NUS cannot become an organization dealing with student issues in isolation. Student interests are threatened by grants as well as nuclear power."

In particular NOLS claims NUS has not fought hard enough against loans schemes, and new student union financing regulations. But on both counts they have their thunder has been stolen with loans schemes about to be abandoned, and an NUS victory on union financing figures. Mr Aaronovitch sees their campaign as old-style sectarianism; unhelpful to the new look NUS.

NOLS has links with 100 Labour clubs around the country but the depth of support at Blackpool is difficult to gauge. Mr Aaronovitch has the majority behind him if he can curb his enthusiasm for telling conference off. Hardly democracy, anyway. If the Alliance cracks, wailing in the hangar

GRADUATE UNEMPLOYMENT WHAT A WASTE!



Poster from the NUS campaign against unemployment

for take-off is a student Social Democrat body. It will show itself at Blackpool but do little more, the far left and the Conservatives have not made advances since last year.

Whatever happens and there is always an element of surprise at NUS conferences, NOLS' approach seems more nostalgic than innovative. The five motions selected by ballot for debate are the funding and structure of public sector higher education, further education, the international year of the

disabled (yes, well above El Salvador and Chile), women's rights and safety, finally racism, fascism and the National Bill.

This last item will test the new inside approach of NUS because certain to come up will a re-run of the old debates on "no platform for racists and fascists". While NUS policy still adheres to the no platform stance, the executive has preferred the low profile approach of "no invitations" avoiding the free speech arguments.

Patricia Santinelli reports on the United Nations University's approach to Third World development

The alternative road to progress

A solution to the most significant problem facing the Arab world, that of "endogenous intellectual creativity", was vital, said Dr Yacoub Al Ghuneim, the new minister of education, at the opening ceremony of a five day symposium bringing together some 55 leading scholars, scientists and policy makers from around the world to Kuwait under the umbrella of the United Nations and Kuwait universities.

"Transfer and imitation have not resulted in full assimilation which engenders creativity," Dr Al Ghuneim said. "Intellectual creativity remains the means for realizing the Arab world's identity. Without it we shall continue to be dependent on others in all aspects."

His words could not have been expressed in a more suitable setting. For although Kuwait has the reputation of being one of the most free, liberal and democratic states in the Gulf, it is nevertheless an example of the imposition of Western culture and technology, encouraged by an oil-rich economy in an area which some thirty years ago was a desert with a people relying on fishing and pearl-diving.

The minister's plea is very much an issue at the heart of the Brundt Report which has stressed how important it is for Third World countries to develop alternative societies and technologies from that of the West, ones which are suitable to their needs and culture.

This theme is also central to one of the United Nations University projects on socio-cultural development alternatives which itself is part of the UNU's three major programmes, that on Human and Social Development.

The symposium is the third in a series of six which form part of the sub-project on intellectual creativity. The first two meetings were held in Kyoto and Mexico.

The project's main aim is to investigate those development alternatives which might evolve from varied civilizations and cultures rather than relying on the Western oriented model.

At its very core is the exploration of creative energies that stem from the heart of each society and draw on its inner strength and resources.

The project coordinator, Dr Anwar Abdel Malek, of the National Centre for Scientific Research in Paris and a leading Egyptian academic, says that its goal is the creation of an international and theoretical workshop in which innovative thinking about development alternatives will be stimulated.

To this end the symposium has been divided into four broad sub-sections which deal with the uses and limitations of the transfer of knowledge, science and technology from dependence to liberation, tradition and civilisation and the process of modernisation and Arab thought in the new international order.

For Dr Malek the meeting was an historical one which brought together some of the major thinkers in the Arab world, of all political spectrums.

"We expected great difficulties, but these people opened their hearts to each other and I truly believe that we are at the beginning of the end of a crisis which has faced the Arab world, thought and politics," he said.

Dr Malek added that two major trends could be identified in the symposium. One was the Islamic fundamentalist approach and the other the liberal modernist school. The first believed that the Arab world was becoming decadent because it had moved away from the teachings of Islam, and the other that a downward trend was the result of missing the edge of revolution.

However, the symposium did not escape criticism. One of the most consistent attacks was that it had achieved nothing concrete.

The organizers argued that they had never made any pretence that the symposium would provide a solution. It had at no time sought a recipe, just greater understanding, and this seemed to have been achieved.

It was felt very strongly that the position of women in the Arab world



Western technology and culture should not be automatically imposed on the Arab world, say the delegates to the UN conference in Kuwait.

should have been discussed more thoroughly, as well as the question of young people and the use of oil as an economic weapon against the West, and it was accepted that a further symposium would be needed to deal with these issues. However, it was stressed that this particular event had been meant to be general.

Perhaps the symposium's greatest drawback was to accusations of isolationism. It was quite understandable that many Third World countries should feel bitter about western exploitation but it is difficult to see why they were allowed to present such a one-sided view.

The main papers appeared to be drawn exclusively from certain areas of the Arab world and only three were from the West. An Indian MP eventually pointed out that the main Muslim population is in Asia, not in the Arab world.

Create the conditions for change

The Arab world must urgently develop a system of education which provided both intellectual practices and a respect for manual and technological productivity. That is the view of Dr Abdel Aziz Kamel, a former rector of Kuwait University and now a consultant to the Amir.

"This development should leave its marks on the following five channels: curricula, teachers, budgets, suitable buildings and administrative regulations. It should have the support of the young generation and be backed by guidance from the mass media and religious institutions," he said.

Professor Abdelhadi Abu-Ridha of the department of philosophy at Kuwait University appealed to Arab Governments to provide favourable conditions in which creativity could flourish.

"I suggest the establishment of highly-specialized institutions and universities in the basic fields of knowledge, equipped with the necessary means and instruments of scientific research which would function in an atmosphere of free scientific thinking and search for the truth. This is how creativity can find its proper opportunity," he said.

But Dr Abdullah al-Dannan, of Kuwait University College of Education, believed that the cause of intellectual creativity could best be served by restoring the Arabic language to its past status as the medium of study in all universities. Currently only Syria used Arabic in such a way, whilst in most Arab countries, with the exception of Iraq, subjects such as medicine, science and engineering were being studied in English or French.

The major importance played by the Arabic language in the reassertion of national and cultural identity, thereby promoting creativity, was also highlighted by Professor Le Thanh Khoi, professor of science education at the University of Paris V.

Putting the case of the Maghreb countries, Algeria, Morocco and Tunisia, he pointed out that the process of Arabisation had so far been confined to the first two years of primary school. From the third year a kind of Arab-French bilingualism existed.

This had several effects: a major one being increased learning difficulties for children with the result that out of 1000 entering primary school, less than 100 actually had access to higher education.

Secondly, the use of French, not only resulted in the continued domination of French culture, but also in discrimination against those children who were from rural or poor urban areas where French is not in daily use.

Dr Shaker Mustafa, of Kuwait University, said the question of civilization identity had arisen because of the widening crisis in Arab civilization which had now become a permanent and pressing problem. Arabs should realize that the pattern of Western civilization was not the only solution, although it could not be ignored.

Arabs were currently facing a serious danger which threatened to create a basic conflict between Islam and Arabism, warned Mr Monah El Solh, a Lebanese writer and politician.

"Success or failure of the Arab world in dealing with its problems depends on the gap between elites and the masses," he said. "The former see the Islamism of the masses as a stand against progress and development, whilst Islamists see the stand of Arab elites as a decision to identify with an alien and alien culture. Arab politicians and innovative thinkers face an important task in reconciling their views."

Dr Soedjaimoko, chairman of the department of philosophy at Kuwait University, said that Arabs must orient their minds, not only to accept the future but also to take an active part in shaping coming events.

"In a world in which the rapid pace of change causes so much worry even to advanced societies, Arabs will have to alter their habit of facing changes with traditional mental structures that are oriented towards the past or locked in the present, while leaving the future to circumstances, and waiting passively," he stressed.

Professor Henri Lefebvre of the University of Paris believed that conditions for the birth of genuine creativity were accumulating in the Arab and Islamic World.

"Europe is tired and dominated by a technical mentality," he said. Islamic countries are stronger because of their unified cultural foundations and will hold steady, before the external influences accompanying technology and its practical implications.

Professor Mohamed al-Rumaili, of

Rector calls for a new World Order

The importance of the United Nations University symposium for the Arab and Third World was marked by the presence of Dr Soedjaimoko, the first rector of the United Nations University ever to attend a regional symposium.

Dr Soedjaimoko told delegates that this occasion would prove important and timely for the academic community of the Arab world to define its own potential contribution to the development of new global perspectives, so badly needed by a planet confronted by problems of unprecedented scale and complexity.

He added that in helping to promote and fill such global perspectives, they must reject the notion that our present situation was somehow answerable to conventional political, economic or technological nostrums.

Dr Soedjaimoko believed that the tremendous creativity displayed by past Arab culture, particularly in science, as well as its impressive capacity for incorporating major elements of other cultures, should be revived and deployed to break any dependency and create fresh insights and impulses towards the shaping of a new, and culturally diverse world society.

Such a new society must possess the instruments to come to grips more effectively with hunger, poverty and ignorance, as well as the underlying structural disparities in a context of shifting power configurations, higher energy costs and population pressures.

Learning how to put science and technology to use wisely and humanely was one of the most daunting challenges faced by any nation.

Dr Soedjaimoko said that whatever strategy was adopted, it must avoid the creation of a new dependence and tap the country's own cultural resources.

Director presses for international progress

One of the greatest challenges facing developing countries is to maintain the pace of progress. To do this they had to adopt contemporary activities and foster their own people's creativity, Dr Mohamed Saber, director of ALESCO in Tunis, told delegates.

He said: "They must adjust to realities, adapt available technology and discover new ways of thinking, organization and techniques. Such a change of attitude should entail combining the rich experience of their own heritage with contemporary technology, so as to provide interaction between national and international efforts."

Making a similar plea, Professor Fuad Akariyah, chairman of the department of philosophy at Kuwait University, said that Arabs must orient their minds, not only to accept the future but also to take an active part in shaping coming events.

"In a world in which the rapid pace of change causes so much worry even to advanced societies, Arabs will have to alter their habit of facing changes with traditional mental structures that are oriented towards the past or locked in the present, while leaving the future to circumstances, and waiting passively," he stressed.

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Through the eyes of a camera

continued from previous page

(1949), which was filmed at the northern mining village of Léciv. However, instead of the mining community being left to speak for itself, we see it rather, as Daquin himself explained in his autobiography, through the eyes of a middle-class mining engineer from Paris (Jean Desailly). Historical flashbacks tell us of past miners' struggles. Somehow the miners seem a subject for intellectual analysis and a moral tale (Jean Desailly emphasizes fully with them by the end of the film) rather than as accepted elements in French society. And indeed much of the industrial working class has continued to be rather isolated in French society. Films of social conscience are more often about the poor rather than the working class. The opening credits to *Une Si Petite Plage* (1949) invite us to think sympathetically of those brought up on public assistance. The milieu, as in other French films of the time, for example, *La Mairie du Port* (1950) is of impoverished café proprietors and fisher-folk.

The one American film before the 1970s to deal with a distinctive working-class environment was of course, *Elia Kazan's On the Waterfront* of 1954. At one point the young longshoreman Terry Malloy (played by Marlon Brando) refers to the waterfront as "like it's not part of America": the working garb, the ungrammatical language, the wedding party in the local saloon, are all beautifully realised.

Johnny Friendly (Lee J. Cobb), the union boss, protests at the beginning of the film, "my old lady raised me kids on a sinking watchman's pension. But he, with his corrupt union, is the villain of the piece. The battle with the union. The only employer we see is at the very end when the battle has been won. "All right," he says, "let's go to work." Films, remember, only offer clues. But anyone endeavouring to study class in America has to remember how much that country continued to be dominated by the ethics of the frontier where the stakes are high, and where laudable union objectives so readily became entwined with gangsterism.

It is in America, actually, that perceptions of class have changed most sharply in recent years. Earlier faith in the openness and classlessness of American society has given way to a much more realistic use of these very British-sounding labels, "middle class" and "working class". The change is represented by *The Deer Hunter*, in which the enduring images, apart from the counterpoint of Vietnam, are of the Pennsylvania steel mills, and *Blue Collar* where again the enemy is the union, but the oppressive ambience is that of the Detroit assembly line; and in *Breaking Away* the class divide between the local descendants of the stone-cutters ("cutties") and the middle-class students on the prestigious state university campus is sharply etched.

French and British films, perhaps, bring out enduring truths rather than social change. Britain emerges as the country with a clearly recognized, proud, sharply defined working class, class-aware rather than class-conscious. Apart from the great range of different middle-class environments, a distinctive upper class, with manners and styles of its own is also portrayed. French and American films, too, suggest that these countries also have a separate upper class. A respectable working class appears less often. Instead American appears to be a country of professional workers and bank clerks, and France as a country of tradesmen and small proprietors. There are links not to be ignored. If we are to build up pictures of class structure which, instead of conforming to the dictates of abstract theory, represent societies as societies see themselves, then film, qualified and mediated by all the other evidence available to the historian, is a source not to be ignored.

The author is a lecturer and director of studies in arts at the Open University.

A healthy work and study sandwich

Alan Daniels outlines the benefits of job experience for students

In view of the recent discussions on the Finniston report which emphasized the importance of work practice in education and the need of the present Government to ensure an adequate supply of young trained people, this is an appropriate time to review the benefits of the sandwich course system. Also its present and future organization if it is going to continue to contribute to our national educational system.

The benefits to the students can be summarised as follows:

- by combining work experience with the planned college programme, theory and practice are more closely integrated and students find greater meaning in their studies;
- the combination of work experience and study increases motivation. Students are able to observe clearly the connection between the work they are doing and their subject at college;
- work experience provides the students with a greater sense of responsibility with more reliance on their own judgement and thus enhances the development of maturity;
- work experience involves the students with other people from differing backgrounds, and in order to carry out their work successfully they learn that it is necessary to cooperate in the work environment.

For students uncertain about their future career, work experience gives the opportunity to examine realistically the various careers open to them in industry.

There are also the following benefits to the employing organizations:

- for the potential employer the selected students can be trained in the standards and practices of the company at the beginning of their career;
- the introduction of young students into an employing organisation often introduces new ideas and methods through the stimulation of fresh thinking unfettered by past experiences;
- in a similar way, contact between the employing organisation and the college introduces new ideas through the experience of the college tutors who are constantly in contact with other organisations with similar problems.

● the employment of a student is an ideal way to approach recruitment. Recruitment, however carefully carried out, is always difficult because it is impossible to observe the potential recruit under work conditions. During the work placement, an employing organisation has the opportunity to observe the student in the working environment. The student also has the opportunity to assess the organisation as a potential employer. If a mutual match is achieved, full time employment can be offered to the student during or at the end of the course. At Brunel University, where we operate a "sandwich" sandwich course degree, we find that this is the trend with university based students being offered full time employment in the second or third years.

These benefits have been reflected in the growth of the sandwich course system over the past 20 years and at present there are between the following universities, Aston, Bath, Bradford, Brunel, City, Loughborough,

Reading, Salford, Surrey, UWMST and the 30 Polytechnics, 53,722 students on sandwich courses of which 23,838 will be seeking work placement this year. The individual breakdown of these figures is shown in the table produced by the Manpower Services Sandwich Course Research Unit.

These figures exclude the Technical Colleges and the 1.3.1 type of course favoured by some organizations. However they do indicate the size of the work placement problem and the need for coordination between the educational institutions, the Department of Education and Science, the Department of Employment, particularly the Manpower Services Commission and the employers.

The educational institutions have already started to coordinate their activities in work placement, by the establishment of the Universities Committee on Integrated Sandwich Courses (UCISC) and the Polytechnics Committee on Sandwich Courses (PCOSC). Both committees are extremely active and exchange information on a regular basis, therefore there has been close cooperation in the establishment of professional standards for student placement and supervision between the universities committee and the polytechnics committee.

The committees recognized that there was a need to involve employers in this coordination since they were the people actually providing the work places required to support the system.

This has resulted in the establishment of the Association for Sandwich Course Education and Training (ASET). The membership of ASET is drawn from all colleges, polytechnics, universities and employing organizations. The employers' interest in contributing to the sandwich course system is clearly indicated by the fact that approximately 50 per cent of the membership at present is made up of representatives from employing organizations.

The objectives of ASET are as follows:

- to publicize, promote and develop the principles and practice of sandwich education and training as being of particular value for high level work in a wide variety of professions;
- support, encourage and develop sandwich courses at degree and higher diploma level in the United Kingdom and thereby make available a high standard of relevant, demanding and varied education and training in whatever subjects may be held to be appropriately taught by this system;
- strengthen the operation and enhance the quality of sandwich courses by promoting closer and more effective partnership between employers, educationalists and students;
- provide a discussion forum for employers, educationalists, students and other appropriate groups and individuals;
- serve as a central agency for the

sandwich course. Assurances were given by the Manpower Services Commission that approximately £2.9m. had been budgeted to assist work placement in the private and public sectors for areas of particular need giving first priority to students with no previous experience. This grant support would be administered by the industrial training boards, and by specially established centres to cover the public sector or employers not under the scope of the industrial training board.

Therefore, through the establishment of ASET, we have moved some way forward in the organisation of activities that should assist the current and future problems of sandwich course work placement. Eventually, we hope that this will lead to the establishment of national plans for training that will not be subjected to fluctuations in Government policies. The situation would be further improved if there were closer co-operation between the Department of Education and Science and the Department of Employment through the establishment of a Joint Planning Committee.

Fig. 1 and Fig. 2 illustrate the situation for engineering degrees during 1979/80.

On November 5, 1980, a meeting was held between the executive committee and the Secretary of State for Employment, Mr James Prior. The objective of the meeting was to emphasize the seriousness of work placement scarcity in the current year. Mr Prior has always shown concern for the work placement section of the

The author is director of the Institute of Industrial Training at Brunel University and chairman of the UK Association for Sandwich Education and Training.

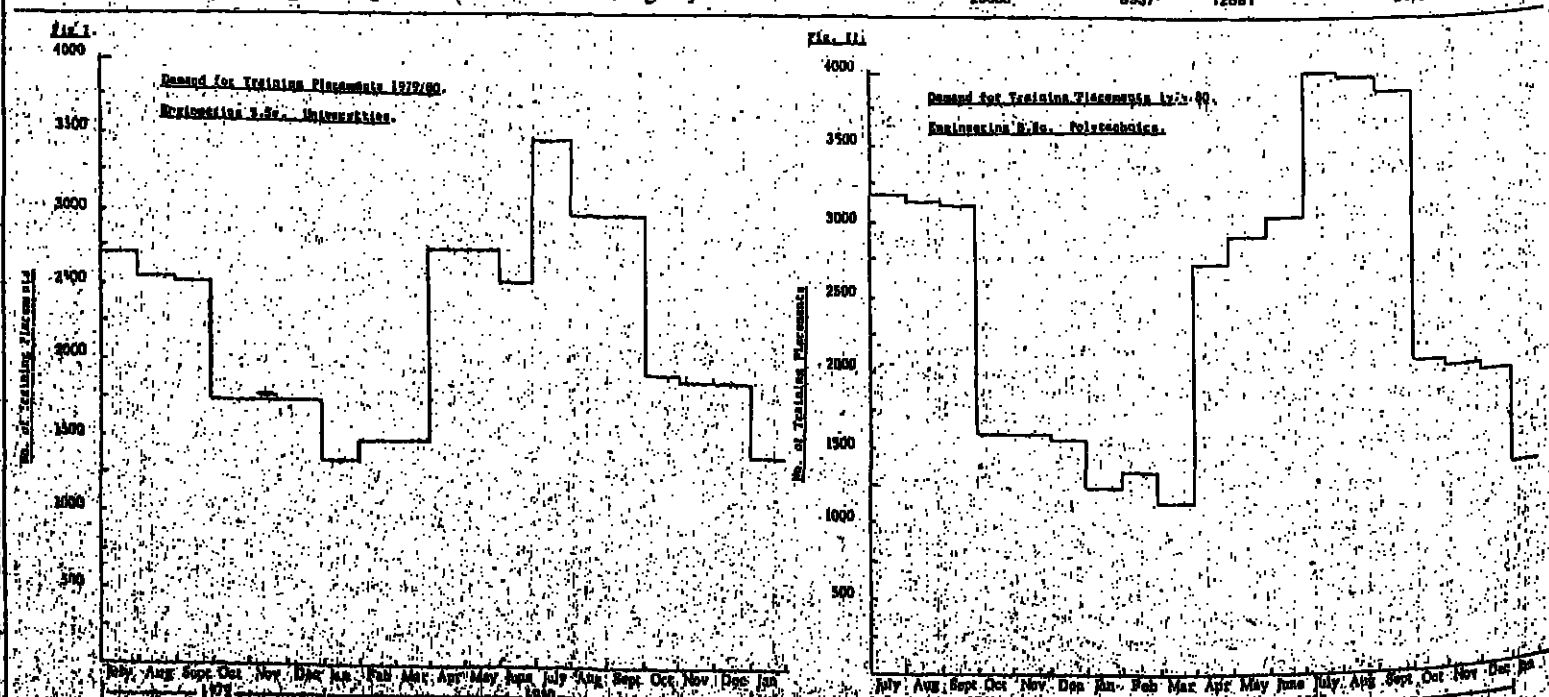
Courses	Univ	Poly	Univ	Poly
Electrical Engineering	1484	2711	1898	918
Mechanical Engineering	1897	2808	1728	1448
Production Engineering	974	437	235	401
Civil Engineering	1740	2142	802	195
Chemical Engineering	763	467	—	402
Other related Engineering	820	806	—	494
Building	348	727	—	227
Quantity Surveying	128	127	117	27
Metallurgy	289	111	85	197
Materials Science/Technology	243	138	—	117
Other related Technology	867	808	248	271
TOTAL:	8470	11482	6731	5377
ENGINEERING & TECHNOLOGY	8470	11482	6731	5377
Biological Sciences	1181	1081	167	528
Chemistry	787	858	207	271
Physics	442	217	93	147
Mathematics/Statistics	344	684	73	134
Other related Science	802	2412	403	234
TOTAL:	2011	3564	468	1814
SCIENCE	3407	5597	833	1450

Courses	Univ	Poly	Univ	Poly
Management/Management Science	224	718	—	80
Accounting/Banking/Finance	128	620	—	31
Economics	106	228	—	107
Government & Public Administration	138	481	—	74
Business Studies	880	8083	1082	276
Law	117	141	—	94
Sociology/Psychology/Social Science	882	683	—	390
Geography	—	115	—	28
TOTAL:	2813	9016	1082	1027
SOCIAL, ADMIN. & BUS. STUDIES	2813	9016	1082	1027
ENVIRONMENTAL HEALTH/MEDICINE	446	308	101	207
Architectural	483	388	—	111
Clothing, Fashion, Textiles	—	480	—	78
Graphic, Interior & Other Design	—	882	—	194
Catering, Food, Hotel, etc.	470	405	1141	108
Other	123	404	108	32
TOTAL:	1078	2230	1250	723
PROFESSIONAL & VOCATIONAL SUBJECTS	1078	2230	1250	723
TOTAL:	18012	28833	8077	8313

Total number of students on sandwich courses in the University and Polytechnic sector (1979/80)

Total number of placements required (1979/80)

	Engineering & Technology	Science	Social, Admin. & Business Studies	Other	Total
UNIVERSITY	8470	3407	2813	1027	15717
POLYTECHNIC	17215	6530	10078	3088	36911
TOTAL	25685	9937	12891	4115	52728



Open secrets and Prior commitments

Harry Law looks at some of the questions which he believes will remain unanswered after the Manpower Services Commission reveals its proposals for an Open Tech.

Education and training, never easy bedfellows, have been struggling vigorously in recent years. Or, as some see it, training has been kicking a somewhat dormant education in an attempt to force an accommodation or effect it from the bed. Not that education is unaware, but preoccupied with qualities which are slow to develop and difficult to measure. Education has considerable inertia and mystique. Broad training has near horizons, can be more precise about its purpose and imbued with a sense of urgency which has been intensified by current economic difficulties and the dramatic rise in unemployment.

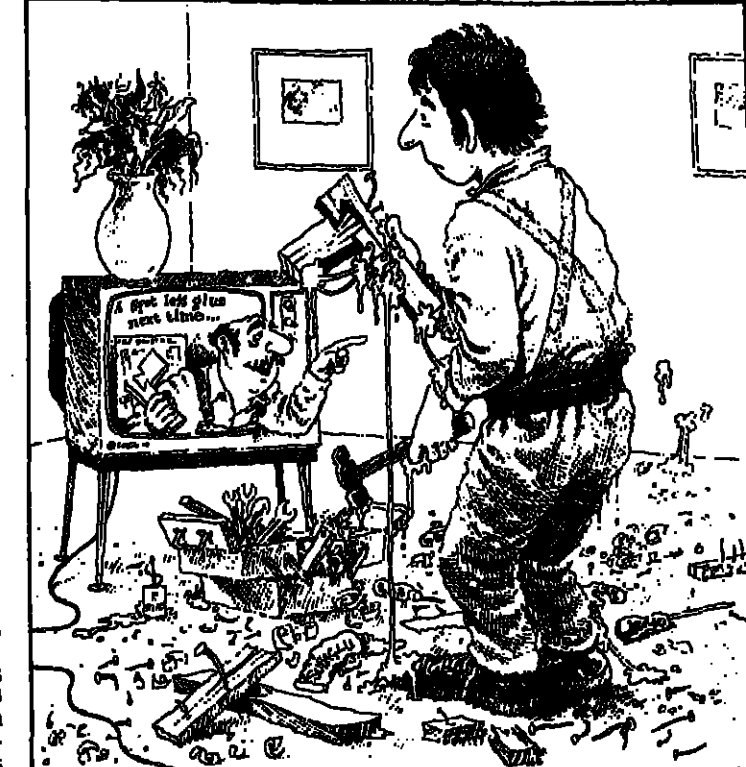
Such an analysis is unjust to both education and training for these terms are by no means mutually exclusive. Much of the training carried out in this country is attributable to universities and colleges which offer training both as an integral and often indistinguishable part of educational courses and as an end in its own right. However, it is not by chance that the Manpower Services Commission and its Training Services Division have developed under the Department of Employment rather than the Department of Education and Science, nor an exaggeration to say that some educationists, particularly those concerned with basic skills and technician work, look with apprehension at the activities of the Commission. The latest moves by the Commission to establish an Open Tech may confirm their fears.

First mooted in 1978 by James Prior, then Opposition spokesman on employment, Open Tech was envisaged as utilising "broadcasts to teach theory with regional centres using spare industrial capacity for practical training". This idea, a latent threat or a potential opportunity dependent on the observer, has waxed and waned through three years of opposition and government. The publication shortly of the MSC's proposals for Open Tech should bring the uncertainty to an end. Or will it?

What the proposals will do - if the rumors are correct - is to herald the birth of Open Tech, establish its general form and funding and delineate the types of courses and qualifications which will be its concern. Initially Open Tech will produce schemes of open learning, in particular for adults at technician and supervisory levels. But uncertainties will remain. What can Open Tech realistically hope to achieve? How big will it become? Is the potential of Open Tech limited to relatively low level work in terms of the skills and techniques involved? Will Open Tech always be restricted to adult students or will it gradually increase its franchise until the entire of post-compulsory education is covered? In short, will Open Tech prove to be just another element in the educational system or is it really an early manifestation and perhaps an instrument of a fundamental transformation which in time will effect the whole system? Although it is early days, there is already sufficient experience to allow informed speculation on each of these issues.

First of all there are the distance learning schemes operating under the auspices of the Technician Education Council and the directed private study and correspondence courses of the Business Education Council. These have flourished naturally from the Haregate Report: which, appearing a year before the Open University enrolled its first students, contained the prophetic passage, "Given that there are students who would otherwise find themselves without tuition... correspondence courses have a part to play in the provision of technician and comparable education. Some form of occasional personal attendance and, where appropriate, practical tuition should, however, be an essential feature of such courses...".

If the report had appeared two years later, reference to radio and television would have seemed inevitable. Secondly, there are the open learning systems aimed at O- and A-level



qualifications or their equivalent, such as the Open College Federation of the North West and the Flexi-Study systems based on a number of centres across the country. Thirdly, there is the unique and vast experience of the Open University itself.

Perhaps the most important immediate effect of Open Tech will be to indicate that there is now Government support for distance learning at the technician and supervisory levels. The colleges' achievements to date have been against a neutral, even hostile administrative background. Distance learning students who do not attend a college do not even appear in the statistics, and staff conditions of service make no provision for teaching such students. There will now be reason to believe that the necessary administrative changes will follow. Distance learning also needs a national centre for co-ordination if it is to succeed.

Open Tech should have the capacity to meet this requirement and to provide a management and funding operation for the production of distance learning materials, an inevitably expensive business. Programmes and courses will doubtless follow and after an incubatory period, the eventual enrolments might be considerable. Speculative schemes offered by colleges have generally recruited well, sometimes revealing a hitherto unsuspected level of interest, while those devised to meet the specific requirements of a particular employer are usually more predictable and can be

even more substantial. For example, the Technician Education Council - a Post Office scheme in telecommunications, which involves over 30 colleges and as many Post Office centres, has over 3,000 students.

Open Tech has been defined as a modest analogue of the Open University and to consider the likely form which Open Tech will assume, it is helpful to examine the implications of some aspects of the university's activities. Only 10 per cent of the studying time of the average OU student is given to viewing and listening, 65 per cent is occupied by systematic reading and 15 per cent by contact with tutors and counsellors. The contact element, achieved through attendance at study centres and summer schools is vital, and there is little doubt that the Open University would not have flourished without the active participation of many academic staff whose first allegiance is to the universities and colleges which are their principal employers. Thus, far from displacing the traditional centres of education, the Open University is in fact dependent upon them. Open Tech will also rely upon traditional institutions for staff support and personal contact with students. As J. Hargrave indicated, the face-to-face situation is far from eliminated in distance learning. The counselling, personal guidance and tutorials are vital and it will be important for

Open Tech that the infra-structure of the educational system is preserved.

A major difference between the problem facing Open Tech and that which confronted the Open University lies in the state of the art. The Open University had to pioneer the development of unit-based degree structures, then unknown in this country, which were not dependent on formal entry qualifications. So much was new that a substantial central core of university personnel was necessary in addition to the peripheral support of part-time staff. In the case of Open Tech, the position is quite different. Open Tech schemes are better understood and unit-based study well established. Technician Education Council awards are geared to unit-based programmes; there is already provision for students to study single units within larger programmes for updating and retraining purposes and the type of award is not related to a particular pattern of attendance. The Russell Report made suggestions about the possible development of open learning networks, the Council for Education Technology has developed an Open Learning Project which has considerable potential, and the Further Education Staff College in co-operation with the council has established a "National Open Learning Systems Information and Consultancy Unit". The level of awareness of distance and open learning needs is really quite high.

One difficulty will perhaps be greater for Open Tech than for the university. Distance learning is relatively straightforward when it deals with non-practical subjects; it is more difficult to arrange with subjects which make demands on laboratory or workshop facilities. The Open University has expended much ingenuity in devising kits and apparatus which can be used in the home, but even so, difficulties remain in some subject areas. For technicians the need for "hands-on" experience is even greater. In addition to some basic understanding of theory, familiarity with equipment and a measure of expertise in the practical situation are also extremely important. It seems inevitable that Open Tech will need to arrange access for its students to the practical facilities located in colleges and polytechnics. For students in relevant employment this type of experience will also be gained at the workplace, but as with traditional study modes, this will not be adequate in most instances to replace the contrived practical teaching situation; for unemployed students, the workplace experience will not exist.

Open Tech therefore emerges as an initiating, managing and co-ordinating body; perhaps more akin to the Annenberg - Corporation of Public Broadcasting model than the Open University, which will need to develop a close-knit national network through the active collaboration of many different organisations. The importance of carrying these organisations along in the establishment of Open Tech is of paramount importance. It is encouraging from this point of view that the

passive acceptance or studied disregard of the possibility of an Open Tech which have been manifest in various quarters seem to be giving way to measured enthusiasm, albeit tempered with caution. How Open Tech is seen by educationists is a reflection of their attitudes first of all to education and secondly to change. No teacher will readily concede a point which he thinks may be disadvantageous to students and fears have been expressed that Open Tech will undercut and eventually displace conventional education, while providing for the majority of students an inferior approach. Even when teachers have been reassured on this score, Open Tech may still appear as a threat with its new methods, its more familiar and therefore comforting world of colleges and classrooms. The National Association of Teachers in Further and Higher Education has had some difficulty struggling in these shadows but now seems likely to emerge with a constructive policy statement about distance learning. Taking recent trauma into account, it is only to be expected that the association will be suspicious that a government intent on cutting expenditure might think of Open Tech as a cheap replacement for traditional methods, but it seems probable that the association will support Open Tech, provided it is a genuine addition to and not a substitute for conventional systems. The Government may in any case be deluded if it thinks that Open Tech will necessarily be cheap, although it might to some extent be self-financing.

Once the collaboration of the colleges has been secured, the establishment of the necessary national network will be able to proceed. However, one crucial decision will have to be made. Where should the regional centres be based? There is no doubt that the Open University can and will wish to play an important role in the development of Open Tech. The university is contemplating the production of core learning materials for professional training and the development of a Learning Research Centre which could be assimilated into the national network. On the other hand, there will be a need to involve trade unions, industry and commerce at all levels and the Open University's regional network is probably not nearly as strong as that of the polytechnics in this regard. In many cases, the polytechnics have helped to co-ordinate the activities of local colleges, for example in relation to schemes leading to awards of the Technician Education Council and as bases for Regional Management Centres. They often possess considerable

educational technology equipment and expertise and they have the advantage, in this context, of being steeped in the FE tradition.

Since Open Tech originated from the Department of Employment it could be assumed that Open Tech will have no problems in trying to involve employers and trade unions in its activities. Educationists will make no such assumption. Although excellent external relations generally exist at the level of individual colleges, the needs of industry at large are generally difficult to define and full collaboration between educationists, industrialists and trade unions in the production of programmes of study hard to achieve. The various validating bodies, training boards and other organisations have succeeded to varying degrees in this matter at national level, but if Open Tech is to help solve the problems of unemployment, an even closer correlation between education planning and the market place will be necessary. As the CPRS report, *Education, Training and Industrial Performance* pointed out, "responsibility for designing, financing and producing training is widely divided between different agencies, institutions and employers themselves". Open Tech by bringing the different interests together, could lead to a more co-ordinated approach and that in itself would be no small achievement.

Open Tech will have a sufficient challenge for the immediate future in attempting to provide what is necessary for adults by way of training and

retraining opportunities. The question must be asked whether in due course it is likely to diversify and extend its remit, even though this could lead Open Tech into conflict with existing educational provision. From the view of Open Tech there may not be much incentive for developing in this way and the government's priority, as indicated by Open Tech's initial brief and by the Department of Education and Science consultative paper *Continuing Education: Post-Experience Vocational Provision for those in Employment*, is obviously adult vocational training. Given the increasing rate of technological development and the ageing population pattern of the 1990s, this is understandable. On the other hand, if Open Tech is successful, might not all students reasonably claim the right to study where and when they please?

A successful Open Tech could extend its range of activities in two obvious directions. It could go beyond vocational education and provide general and recreational programmes. As it is difficult to see any valid objection to this, provided there is a demand, a move in this direction might be anticipated sooner or later. Open Tech could also extend its activities to cover younger students, perhaps from the statutory leaving age upwards, but in this case there are real problems and dangers.

Distance learning, as opposed to the use of learning packages in schools and colleges, is usually considered to be least suitable for young students and there are obvious reasons why this is likely to be so. Nonetheless, if a distance learning mode were available, young people might be induced to use it against their own best interest. At present, there could be a pecuniary advantage in distance learning because attendance at a college for more than 21 hours a week affects unemployment benefits. This situation could presumably be altered by a simple administrative change. Another danger, that universal availability of distance learning modes could generate atavistic trends in some employers, is not so easily disregarded.

The present pattern of day-release courses for young people has not been established without opposition since if employers were to provide day-release facilities because distance learning was available, this could have quite adverse consequences. Yet, if the education and training services do not provide what is required, some employers may be tempted, particularly under financial stress, to withdraw from the system entirely and revert to on-the-job training. This becomes even more attractive with some of the sophisticated teaching equipment now available. The eventual extension of Open Tech to include younger students but at each step, a detailed analysis of the implications would be needed so that inadvertent risks could be avoided.

Looking on the positive side, a high proportion of school leavers entering employment does so without any further education or training. If Open Tech could help to reach these young people that would be a truly worthwhile achievement. As the joint MSC, BEC, IBA Study Group reported, there is also a co-ordinating task to be done at the level of individual colleges, the needs of industry at large are generally difficult to define and full collaboration between educationists, industrialists and trade unions in the production of programmes of study hard to achieve. The various validating bodies, training boards and other organisations have succeeded to varying degrees in this matter at national level, but if Open Tech is to help solve the problems of unemployment, an even closer correlation between education planning and the market place will be necessary. As the CPRS report, *Education, Training and Industrial Performance* pointed out, "responsibility for designing, financing and producing training is widely divided between different agencies, institutions and employers themselves". Open Tech by bringing the different interests together, could lead to a more co-ordinated approach and that in itself would be no small achievement.

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The author is the director of Preston Polytechnic and chairman of the education committee of the Technician Education Council.

BOOKS

A man of influence

by Richard Crockatt

Patrick Renshaw

Indeed to label Lippmann a journalist is to invite misunderstanding. Apart from a brief spell after graduation from Harvard as an assistant to muckraker Lincoln Steffens, Lippmann rarely involved himself in fact of the matter writing. He went to the editorial

Walter Lippmann: "he sought influence through the word, making a niche for himself in that curious middle ground where ideas and actions meet and exchange uneasy greetings"

And influence, as Ronald Steel acutely observes, was Lippmann's stock-in-trade. Despite his reputation for Olympian detachment, Lippmann was never less scrupulously enterprising than when he sought to enter the fray either in print or behind the scenes. Presidential candidates from Alben Barkley to Dwight D. Eisenhower, Smith in 1924, Wendell Willkie in 1940, and Eisenhower in 1952, to Kennedy and Johnson in the states south and either took or ignored his advice. Either way, in the long run Lippmann was scarcely the loser. For although he repeatedly risked snatching his own advice from young journalists — that they should never get too close to a politician as a rule, but, on the other hand, to be

been as interested in social discipline as in social liberation. His concern for social order grew precisely out of his lively awareness of the irrational in politics. In *A Preface to Politics*, where he broke new ground in his employment of Freudian psychology as a tool of political analysis, he was sanguine about the possibility of harnessing the irrational in the service of the rational. But with the advent of the First World War he began to have doubts. In *Public Opinion* (1922) he came to the conclusion that it was no longer possible to believe in "the original" dogma of democracy and the knowledge needed for

Ultimately Lippmann's centrality to American history and interpreter of the "American Century" — which Steel's biography amplifies and fortifies — most part brilliantly substantiated — is so much to do with the fact that, in Lippmann's own words, he was a "centrifugal" survivor from the time before the war up to the renaissance of this century... born as a renegade in one epoch and lying in another. Like Arnold Toynbee, whose life space was almost exactly the same time as Lippmann's, Lippmann possessed a detachment and a serenity, equivoical as it undoubtedly was, stemming from his roots in a more spacious time before the great divide of the First World War. HE was seduced, as befuddled but never finally abandoned by the illusions of the first half of the century. Ronald Steel calls that "In effect there were two Lippmanns: the man who wrote one weekly magazine, a daily newspaper, and finally a syndicated column without ever missing a deadline, and the man who retreated to his 'pool of silence' and speculated on a 'longer past and a longer future.' Perhaps this quality in Lippmann, which lent him a certain detachment, heroic character, allowed us to say that in the case at least, never improve with the years." *Richard Crockett lectures in history at*

It was right to include him in this series of offers others "the best essays of leading scholars . . . in a convenient form", and which presents the essays in photographic reproductions of the original published in *ELH*. An economy, the price is \$10.00; yes, but the cost of cut-price reproductions is far from it. The old familiar type-faces from *ELH*, *JEGP* and others assembled here as a kind of visual documentation, handsomely mounted, of Professor Landau's appearances on the literary scene over many years. Add to this a newly written introduction in which Professor Landau neatly draws together the leading strings of the separate little pieces, and the index ("contents" of the 140, 141; winding, reaching to carnality, 142; "embolism" (ecstasment), 145. See also preformational "wea, 43; see also dropical head" with some lessing frustrations in it, and one gets a very respectable, not to say impressive picture of the life of the Landau Land.

And the Impression one gets is rather like that of the "detail" from some well known portrait: once the viewer has seen the head stretching unseen behind the slits, Prof. Landau is good at back stairs, quite justifiably seeing them as

Inherent in all the essays is a scholar's patient determination to keep working towards correction and clarification. "A better balanced conception of Swift", "a more accurate conception of Swift's character", "a more accurate and balanced conception": these are the constantly recurring motifs. And they are paralleled by his concern for what careless or less

Yet, after all, whatever is as learned, scrupulous, uneccentric, informative, amused and appreciative as the essays in this book will certainly last, and quite justifies the publishers in looking out for materials of "strength and durability" in which to bind it.

John Preston

John Preston is professor of English at the University of Warwick.

Did society kill Roger Ackroyd?

assumptions that individual human consciousness is the ideal subject of literature. For Knight it is not—particularly in the detective story. After all, what is to be detected is a crime; and a crime is to be detected in a complex pattern of social forces. The solution of a crime becomes an exposure of the social dynamics that lie behind it, and the indictment of the crime

If I could believe this, I should enjoy McBain's novels a good deal more than I do. For an alternative explanation for the triviality of much detective fiction is not that the detectives are too little subordinated to the impersonal processes of detection, but that they conform excessively to stereotyped ideas of what they should

Patrick Swinden

Patrick Swinden is senior lecturer in English at the University of Manchester.

The role of the patron

declared musical interests and accomplishments of the dedicatee. Similar household records of the period contain host of indications of musical activity—progress—payments to teachers and formers, the purchase of instruments and strings, the supply of "nether stocks" the singing boys—but stop consider the short of revealing details about the music which was performed, or the standard of performance attained; nor, in cases, do they disclose the identity of composers and performers involved, a tantalizing and interesting exception being a 1792 catalogue, John Wuby, whose intimate association with the Kytson family is attested.

The brief accounts which the author provides of the aristocratic families involved, together with genealogical tables and location maps, are neatly done, though one might question the wisdom of using near-contemporary maps (taken from Christopher Saxton's *Atlas of England and Wales*, 1645, and doubtless somewhat expensive to reproduce) which, though decidedly decorative, are extremely tedious to the eye.

Basil Smallman

well *Basil Smallman is professor of music at the University of Liverpool.*

A Stevenson guide

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Presented as an expanded bibliography (and closely based on an earlier PhD thesis) this is a surprisingly readable and certain invaluable Baedeker to the tortuous terrain of Stevenson's many drafts, projects and collaborations, as well as to his published work.

Brian Morte

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Patrick Swinden is senior lecturer in Engineering at the University of Manchester.

BOOKS

Awaiting appraisal

A Primer on Ethnomethodology
by Kenneth Leifer
Oxford University Press, £3.25
ISBN 0 19 502629 2

It is now 14 years since Garfinkel's *Studies in Ethnomethodology* established a presence within sociology and the time has surely come for a serious appraisal of the perspective and its achievements. That such an appraisal is so late in arriving may be seen as a result both of the substance of ethnomethodology and the manner of its arrival.

Ethnomethodology emerged during the heady days of the late sixties, propelled on a wave of enthusiasm among students who believed that it gave theoretical expression to the idealistic delusion that social reality is totally and unresistably malleable. With such a provenance, it was understandably viewed with some scepticism in more senior sociological circles and this scepticism hardened into hostility when the upstart was perceived to have offered two powerful constituencies within the discipline. The quantitative researchers were dismayed at the engendering of an insistent focus on failures of objectivity arising out of the application of quantitative techniques which, although well known to practitioners as "technical difficulties", were previously less well understood by consumers (including a growing population of sociology students). Meanwhile, in the commanding heights of the discipline, traditional theory groups resented ethnomethodologically inspired attacks on the scientific status of their concepts while the new breed on politically engaged theorists, a plentiful species during this period, disliked the apolitical and apparently trivial nature of ethnomethodological investigations. Hostilities peaked in 1975 when the presidents of both the British and the American Sociological Associations devoted substantial portions of their presidential addresses to attacks on the prodigal.

It is unlikely that Garfinkel has taken pleasure in this unintended coup de scandale. A man of the highest standards of intellectual conduct, sensibility and aspiration, he has never courted controversy nor has he intervened in the critical fracas "about" ethnomethodology generated in the hurry-burly of the last decade. In fact it is noteworthy that in the course of the fray, Garfinkel's own foundational work has rarely been systematically discussed. Instead, various degraded simulacra of his complex thought have been the objects of contention. This outcome, the natural product of the sheer difficulty of Garfinkel's work together with the urge — among supporters and detractors alike — towards polemic simplicity or bowdlerized "relevance", found

its most sophisticated expression in Croule's brilliantly propagandist empirical investigations.

The net result of these developments is a widespread failure to understand Garfinkel's theoretical endeavours. Since the early forties he has laboured relentlessly to give coherent theoretical expression to the intricate, reticulated relationships through which judgments of social solidarity are permeated by the demands of social solidarity. Although this task has been on the sociological agenda since Marx and Durkheim, the response to Garfinkel's writings exhibits a general failure to grasp even the constituent elements of the problem. (For example, the de-thronement of "rationality" as a central descriptive device of sociological theorizing has already generated the best part of 40 years' confused delirium.) Moreover, major and tangible results of Garfinkel's initiative — in the sociology of action and interaction and, more recently, in the sociology of science — likewise remain more or less unavailable to the sociological mainstream. A first goal of my introduction will be to describe and place in context these basic dimensions of the ethnomethodological programme.

Unhappily, Kenneth Leifer's *Primer* is not a reliable guide to the motivating issues of ethnomethodological inquiry. Influenced, perhaps, by the prospect of an American undergraduate audience, Leifer has produced a superficial and repetitious summary of some of the central themes of Garfinkel's writings (common-sense knowledge, indexicality, accounting practices, and so on) which, irritatingly, presents them entirely shorn of their sociological and epistemological contexts and implications. The net effect is of a series of minuscule demonstrations whose purpose and value are neither thoroughly described nor convincingly argued for. In the process, the major research streams within ethnomethodology are neither identified nor described (the omission of a substantial and up-to-date account of conversation analysis is particularly glaring), while the origins of the movement are depicted, grotesquely, as a marriage between Husserlian phenomenology and Chomskian linguistics.

It is disappointing to note these and other inadequacies in the author's presentation of the ethnomethodological corpus. Taken collectively, they add up to a further detriment of the provision of a text which would furnish a satisfactory introduction to the domain for undergraduates and their teachers.

John Heritage

John Heritage is lecturer in sociology at the University of Warwick.

The social organization of ethnic groups

Sikhs in England: the development of a migrant community
by A. W. Helweg
Oxford University Press, £5.75
ISBN 0 19 561150 0

London Pundits: a case study in urban ethnicity
by Harald Tamba-Lyche
Routledge & Kegan Paul, £12.50
ISBN 0 7100 8471 4

In the social sciences pre-conceptions, die hard, and the notion that Britain's ethnic minorities are destined for eventual assimilation is no exception. Of course, the naive optimism characteristic of the 1950s and early 1960s has long since given way to an emphasis on "ethnic" "minorities", and on cultural conservatism among the minorities, as contrary forces. The general idea persists, however, that these are obstacles rather than barriers, and that integration will come about in the course of time. Such views either ignore, or misconceive, the factor of ethnicity. These two books testify, in their different ways, to the vitality of ethnicity as a feature of modern society, and suggest that it may become increasingly significant, if more so, as the changes in the world continue.

Helweg's study is not overtly directed to the theme, in any sense, of providing a "critical profile" of the post-war settle-

ments of Sikhs in one particular locality, that of Gravesend. Intending to appeal to a relatively wide readership (in India as well as in Britain), Helweg adopts a broadly narrative framework and presents many of his findings in terms of case-studies of individuals, thus leaving the sociological element in his analysis largely implicit.

His most prominent theme is the "development of community". He chronicles this process as it occurred within the migrant settlement, but he also emphasizes a wider context to which the term applies — a context within which, as communications networks grew, the "Gravesendians" and their main settlement became increasingly linked into a single field of social evaluation and control. The crucial factor in this development, of a permanent Sikh community in Gravesend, Helweg argues, was paradoxically the 1962 Immigration Act, in that it prospectively denied entry to those who were not already established in the country. The effect was to create a settled population with a relatively stable and balanced social composition, capable of cultural self-theorization, and with firm potential (if not ideological) commitments to remaining in Britain. Because of this, newly founded solidarity between the settlers and their families was better placed to resist both individualistic pressures and the atomization of their diversity. Sikh identity became, correspondingly enhanced, and they increasingly

Power Without Responsibility: the press and broadcasting in Britain
by James Curran and Jean Seaton
Fontana, £2.95
ISBN 0 00 634638 3

Charting the development of media policy is at least as complicated a task as charting the development of the media themselves. The very idea of such a comprehensive policy in this country has not, in fact, been generally accepted. Newspapers, sound broadcasting, television and the film industry have been investigated and dealt with in radically different and often contradictory ways, and one of the most illuminating chapters in Curran and Seaton's rather slanted survey deals with some of the contradictions. It is misleading, though for various reasons understandable, to treat separately what should have been treated together. Curran and Seaton reveal all the linkages.

Since, however, they are both involved or have been involved with Labour Party study groups, their detailed proposals for reform, set out tidily in their last chapter, are familiar enough already. Their object is to achieve a "unified policy for communications" pursued by a single Ministry of Communication, Arts and Entertainment, ACE. (What about science?) Such a mammoth ministry, which it is easy to sense even before it comes into existence, would cover a number of fields not dealt with at length in this book, notably book publishing, libraries, theatres and sports. At best it sounds like an Orwellian monstrosity, and although the case for it is presented in terms of "rationalization" to

facilitate "the development of an integrated policy", to call what is proposed in this book "rationalization" is an absurd misnomer. The Minister, backed by a host of civil servants, would be dealing with an impossible range of assignments and would take up a disproportionate amount of parliamentary time, not necessarily on topics identified by Curran and Seaton. As the Minister moved from rationalization to control (doubtless via guidance), he would be under perpetual fire, and if he were to seek to control either he would offer real threats to individual and group freedom.

There are no resonances in this book, no backward references to Milton or to Mill. In so far as specifically British elements in a tradition are identified, they are related not to freedom of expression but to public service. The enemy is seen not as bureaucracy but as profit. This is one approach to the problems of communications history, but only one, and alternative approaches are dealt with very sketchily.

In the detailed reform proposals, too, there are many threats to individual and group freedom hidden away behind a suspiciously bland façade. There are also many smooth assumptions about how a hypothetical alternative system would operate. Given what is happening to higher education policy, how can the authors seriously suggest that BBC licence fees should be replaced by a quinquennial award from Parliament? Given what is happening to health and social security policy, how can they seriously suggest that structural reforms strengthen quality? Given the power of vested interests, how can they seriously suggest that nominated

representatives on boards of government would make the boards work better? Any hint of blandness would disappear, of course, not only in the event of implementation of their proposals but during the bitter debates which would precede it. The bitterness would not simply be engendered by threatened vested interests: it would reflect different values on the part of people seriously concerned with interpretation of the public interest.

Some of the reform proposals are sensible enough and would strengthen that interest. Others are based more on suspicion than on experience. Moreover, while there is some talk in the book of the comparative experience of other countries, efforts which resulted in the recovery of partial differential equations related to the phenomena. Much of the early work was focused upon the exhibition of exact solutions of special equations, such as Laplace's equation, the heat equation and the wave equation, which play a prominent role in physical questions; and this preoccupation, natural though it was in those days, inevitably led to the decidedly experimental appearance which the subject had until the present century.

Another characteristic of this early work was its concentration upon linear equations, partly because of their intrinsic interest but also because the non-linear equations which accurately described some physical phenomena were deemed to be too difficult to study and so were linearized.

Today the position is radically different and the subject now has a sense of purpose lacking from the earlier work: non-linear equations still present severe difficulties, but progress has been made on a wide and rapidly expanding front. All this has been achieved by the abundant use of topology, algebraic topology, global analysis and, of course, functional analysis, both linear and non-linear; and the interaction with these topics has so often been of a symbiotic nature that it may now fairly be claimed that the theory of partial differential equations occupies a position of central importance in modern pure mathematics.

Despite this, the subject occupies a strange position in the British mathematical scene. Many of those with interests in applications feel that the more recent theoretical developments, with their emphasis on existence, uniqueness and qualitative behaviour of solutions of partial differential equations, and their use of tools from diverse parts of pure mathematics, are not for them. Naturally there are several conspicuous exceptions, but all too many remain content with the inadequate methods and standards of proof of bygone ages. Moreover, the pure mathematical view is often that the subject is part of applied mathematics or engineering rather than a vital branch of analysis. Prejudices like this are formed

at the undergraduate level, for most students meet partial differential equations only in an applied, non-rigorous context, remaining ignorant of its intimate connections with modern analysis. This early conditioning rears its inevitable head with postgraduates, many of whom seek clear of the subject in the belief that it is nothing more than a disreputable farrago of tricks, devoid of intellectual interest. Such attitudes are in striking contrast with those common abroad. In Paris, for example, the subject is one of the most popular for postgraduate study, and is clearly seen as a fascinating topic with a very healthy interaction with other branches of mathematics.

A contributory factor to this dismal story is the quality of textbooks on partial differential equations written in English: until comparatively recent times, with a few outstanding exceptions, writers on this topic have not been conspicuously successful in presenting it attractively and with precision. Up to the early 1970s there were the old classics, such as *Methods of Mathematical Physics* by Courant and Hilbert (but the original 1937 German version of volume two is in many ways to be preferred to the much later English version, which omits many of the most interesting and seminal analytical parts), a few more modern classics, such as Hörmander's *Linear Partial Differential Equations*, which presents a large amount of material most efficiently in relatively few pages (perhaps too efficiently for most readers), and a few stimulating but not really concerned overmuch with questions of precision or proof. Fortunately the position is improving, and over the past few years there has been a steady trickle of books which seek to take a seriously analytical approach to the subject.

The two books under review form part of this trickle, and of them Gustafson takes the broader view: his stated aim is to provide a satisfactory introduction to partial differential equations and Hilbert space methods at the undergraduate level, while at the same time exposing the basic ideas of the subject to graduate students of mathematics and to other interested scientists, yet resisting the temptation to be carried away by topics such as functional analysis, which play a prominent role in the exposition. He sees the prerequisites for reading the book as calculus up to the point where elementary systems of ordinary differential equations are treated; advanced calculus is not required, and indeed he suggests that for applied students the book may offer an acceptable alternative to a year-long advanced calculus course.

The book consists of two chapters, each just over 100 pages long, and a nine-page appendix on first-order equations. Chapter one moves quickly through the three basic types of partial differential equation, the corresponding boundary-value and initial-value problems, standard

optimal experimental design has arisen in the USA. The rather empirical British tradition in statistics has shied away from the great advances in decision theory started by Abraham Wald and connected to the parallel developments in optimization and game theory. Part of the reason for this may have been R. A. Fisher's antagonism towards these developments. Professor Jack Kiefer (now at Berkeley) and his co-workers set up a clear mathematical definition of a good experiment and proceeded to solve the optimization problem. Fortunately, some of the classical combinatorial designs turned out to be optimal but in addition a rich new theory of design for regression experiments was created.

The theory established a foothold in this country at the beginning of the 1970s and Professor Silvey must take much of the credit for this. His book is a very clear and concise exposition of the foundations of optimal design and some subsequent developments. One of these is the question of implementation of computer algorithms for generating optimal designs. They proceed by either, actually or theoretically, adding new observations to an existing design or mixing a weighted combination of new points with

BOOKS

A vital branch of analysis

Partial Differential Equations and Hilbert Space Methods
by Karl E. Gustafson
Wiley, £10.00
ISBN 0 471 04089 4
Analytic Theory of Partial Differential Equations
by D. L. Colton
Pitman, £24.00
ISBN 0 273 08462 3

The origins of the subject of partial differential equations lie in the efforts made centuries ago to provide a mathematical analysis of various physical phenomena, efforts which resulted in the recovery of partial differential equations related to the phenomena. Much of the early work was focused upon the exhibition of exact solutions of special equations, such as Laplace's equation, the heat equation and the wave equation, which play a prominent role in physical questions; and this preoccupation, natural though it was in those days, inevitably led to the decidedly experimental appearance which the subject had until the present century.

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methods of solution (separation of variables, Green's function methods and variational techniques) and physical considerations, to a very brief discussion of bifurcation theory. The other chapter uses the separation of variables method as a vehicle for the development of Fourier series, variational and numerical techniques, and contains a few pages on scattering theory.

The book successfully conveys some of the flavour of modern work, but it makes rather severe demands on the reader, or at least on the applied reader of the kind he envisages, who would be faced with the alternatives of either taking a great deal on trust, or spending much time filling in gaps in his mathematical knowledge. For example, the treatment of Lebesgue spaces, distributional derivatives, Sobolev spaces and the continuous spectrum, to take a few topics at random, is very brief indeed; and the cumulative effect of having to find out enough about such matters to appreciate the book properly, even with the help of the exercises scattered throughout the text, might well be too much for the mathematically unsophisticated student. Of course, those well prepared would know all this material, but probably they would be directed to more comprehensive accounts of the theory; other readers might be too dependent upon inspiring supplementary lectures by a gifted instructor for this book, interesting though it undoubtedly is, to be unhesitatingly recommended for course adoption.

Colton's book is much more self-contained, but is solely concerned with the rather specialized part of the theory amenable to the use of complex function theory and typified in the research literature by the work of R. P. Gilbert and the author. After two chapters devoted to maximum principles for elliptic and parabolic equations, Phragmén-Lindelöf, chapters three and four deal with the analyticity of solutions with analytic coefficients and the problems of unique continuation of these solutions, these results being used in chapter five to establish Runge approximation theorems. Chapter six provides an introduction to the theory of pseudo-analytic functions, and the final two chapters deal with the prototype improperly posed problem, the backward heat conduction problem, handled by logarithmic convexity methods, and the inverse scattering problem. The use of functional analysis is minimal, and in fact the prerequisites for reading the book amount to no more than a basic knowledge of complex analysis. The book is clearly written and can be recommended to those interested in this particular corner of partial differential equation theory.

D. E. Edmunds

D. E. Edmunds is professor of mathematics at the University of Sussex.

The situation was now an interesting one. Despite all this success in application, the basis of the theory was in a mess. Weierstrass provided the satisfactory basis for it: at any rate the simplest problems, while on the other hand Clebsch and Mayer concentrated on bringing more and more general problems under the theory. In this way the theory reached an apparently finished form as described by Hilbert in 1900. The book concludes with the years immediately following, taking up the consequent "mopping up" problems. I say "apparently" since the later part of this century has seen another rebirth of interest in the subject, both in the theory of multiple integrals and in Morse theory.

The author's style is one which requires slow reading, but which repays it. A well-known feature is the very extensive quotation from primary sources (the careful reader is put in very direct contact with the theory at various stages in its development. I would have welcomed a little more explanatory matter relating the ideas to other developments in mathematics and physics at the same time, but the book is already long and there is nothing in it I would care to see removed.

C. W. Kilminster

C. W. Kilminster is professor of mathematics at King's College, London.

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BOOKS

Classroom mathematics

Children's Understanding of Mathematics: 11-16
edited by K. M. Hart
John Murray, £3.50
ISBN 0 7195 3772 X

Women and the Mathematical Mystique
edited by L. H. Fox, L. Brody and D. Tobin
Johns Hopkins University Press, \$10.00 and £3.50
ISBN 0 8018 2341 2 and 2361 7

It is gratifying to report two valuable additions to the literature on mathematical education. These two books deal with very different aspects of the process of teaching mathematics and, as such, are important reading for all those concerned to improve the effectiveness of what goes on in mathematics classrooms. We are far from obtaining a general theory of mathematics teaching but each of these publications deals very effectively with several aspects and provides analyses of considerable value in understanding the problems that face us.

Children's Understanding of Mathematics: 11-16 is a report of the mathematics part of the Concepts in Secondary Mathematics and Science Project based at the Centre for Science Education, Chelsea College, London. It is a most important contribution to our understanding of mathematics teaching and learning, providing, as it does, a detailed analysis of the hierarchical development of many of the most common topics in secondary school mathematics. One might almost call it an "anatomy" of school mathematics, as it is based on the careful "dissection" and analysis of the responses of about 10,000 children to a bank of test material derived from the project and to be made available to teachers from the National Foundation for Education Research. Dare one suggest that this material should be compulsory reading for specialist teachers of mathematics before they complete their training in the same way that a doctor needs to know his anatomy?

Each of fourteen topics (drawn widely from arithmetic, algebra and geometry) is presented in the form of a hierarchy of learning with each identifiable stage carefully defined. The difficulties, errors and

false strategies which children display are considered in detail, although there is certainly room for a great deal more research in the future. The interrelation between the hierarchies for each topic is discussed but no attempt has been made (thankfully) to suggest some sort of global developmental sequence.

The book deals essentially with practicalities rather than broad theoretical issues and is therefore potentially of great value to practising teachers. Many of the myths about children's understanding of various mathematical topics are laid to rest and there is a useful, down to earth discussion of the implications of this work for teaching. In particular it is clear that we expect too much from many children - the jump from the practically based early stages in each topic to the point where genuine mathematical abstraction occurs is clearly very large and probably too large for many children to make. For many, learning through an apparatus-based approach would seem to be essential throughout their schooling. It is also revealing to learn about the various avoidance strategies that children use in order to get round apparent problems - "for the most part children did not use teacher taught algorithms".

This is an important book which raises once again the question of how we can disseminate effectively findings such as these to all specialist teachers of mathematics. Pre-service training is too short (perhaps it is now time to lengthen it) and in-service training is inefficient. Those who particularly need to read this book, won't, but those who do will gain a great deal from it.

Women and the Mathematical Mystique is a collection of material by twelve authors and is based on the proceedings of the Eighth Annual Hyman Blumberg Symposium concerned with women and mathematics. It is entirely devoted to the American situation and consequently there are a number of reported findings which may not transfer to other cultures. Indeed, one of the important suggestions for future research is a comparative study of different cultural and ethnic groups in other countries. Nevertheless the basic issues are very familiar - fewer girls choosing to study mathematics than boys; attitudes tend to assume that male domination is inevitable; and so on.

The book is in three parts, the first dealing with female mathematicians and the mystique that (apparently) surrounds

them. Views of mathematicians, both male and female, are reported together with the attitudes of students to women mathematicians. The second part contains chapters which deal with sex differences in achievement in mathematics in school, with the consequential reduction in career opportunities for the girls and with large talent differences found in a series of talent hunts for mathematically gifted children. An issue of great importance which the book deliberately does not cover is the nature of intrinsic psychological differences between boys and girls in mathematical functioning, an issue which is of particular relevance to the study of the mathematics gifted.

The third part of the book provides accounts of a number of attempts to improve the performance of women in mathematics. It is interesting to report that all the attempts made were with girls classes, with the intention of providing a female-oriented course. Important aspects were the provision of female teachers and visiting female mathematicians to talk about their work and to provide helpful role models and the provision of the applications of mathematics that deal with social rather than scientific/mathematical issues. The absence of boys provided the opportunity for the development of large peer groups of girls who could acquire increased confidence in their own ability to succeed in the subject. All the experiments report a significant increase in the achievement of the girls and a change in their attitude to mathematics. It was not clear which factors had contributed most to the change but segregation of the sexes may well have been important, a conclusion which is exactly palatable in a society where there is continual striving for sexual equality.

The book as a whole provides an excellent resource for anyone concerned with the problems of sex differences in mathematics. It contains a lot of references, almost all to American literature, and very useful set of recommendations for further research. Unlike the first of these two books it is not a text for teachers training even though the issues that it deals with are very relevant to teachers in general.

G. T. Wain

G. T. Wain is senior lecturer in mathematical education at the Centre for Studies in Science Education at the University of Leeds.

The ultimate structure of matter

Models of High Energy Processes
by J.C. Polkinghorne
Cambridge University Press, £11.00
ISBN 0 521 22369 5

The past decade has been one of rapid and exciting change in high energy physics: a combination of important experimental discoveries and fundamental theoretical advances has led to a vast increase in our understanding of the ultimate structure of matter. Ten years ago the first experiments on the deep inelastic scattering of electrons and neutrinos by hadrons (the generic name for strongly interacting particles such as protons and neutrons) had just revealed that hadrons have a pointlike substructure as predicted by the quark model of Gell-Mann and Zweig. Support for this model was also being provided by the high rate of hadron production in the head-on collisions of energetic electrons and positrons in the new colliding beam machines.

Within a few years the theoretical scene was transformed by "the gauge theory revolution". First, 't Hooft showed that the generalizations of quantum electrodynamics known as non-Abelian gauge theories are renormalizable (that is, they yield finite predictions for physical processes) to all order in perturbation theory. Even when the non-Abelian local symmetry is spontaneously broken, then it was discovered that among these gauge theories there are some containing an unbroken non-Abelian local symmetry, which differ from all other known quantum field theories in being "asymptotically free": a piece of jargon which describes the weakening of inter-particle forces with increasing energy.

The first result led to an upsurge of

interest in the unified theory of weak and electromagnetic interactions which had been formulated in the mid-1960s: the subsequent discovery of neutral current weak processes in quantitative agreement with this theory led to the award of the 1979 Nobel Prize to its authors, Glashow, Salam and Weinberg. The second result, by showing how a field theory could reconcile the strength of the almost free behaviour of their constituents, opened the way for the current gauge theory of hadrons, known as quantum chromodynamics, in which Gell-Mann's quarks interact by way of an octet of "gluon" fields.

In the middle of the decade the spectacular discovery of the J/ψ family of particles, and the subsequent detailed examination of their properties, established the power of electron-positron colliders as instruments for producing and studying the largest of them as yet, PETRA at Hamburg, was providing ample confirmation of the principal features of quantum chromodynamics.

Models of High Energy Processes, whose author was until recently professor of mathematical physics at Cambridge, is conceived only incidentally with these revolutions in high energy physics: they occur off-stage. In this particle play, but the knowledgeable reader will detect their influences on the text. What it is concerned with is a number of mathematical techniques by which approximate calculations of the cross-sections for various high energy processes may be carried out within the general framework of relativistic particle quantum mechanics. It is in this sense that the author uses the word

"model".

Some of the techniques, such as those of Regge theory which are relevant to the asymptotics of high energy processes at fixed momentum transfer, are based on the behaviour of sums of infinite series of Feynman diagrams in perturbation theory. Others, such as the hybrid model theory, which are the hybrid model theory, are applied here to the deep inelastic scattering of leptons by hadrons, the hadronic production of lepton pairs (the Drell-Yan process), and to the production of hadronic collisions, are non-perturbative. What they have in common is that they deal with the most part, they originated in the 1960s when many theoretical physicists had given up hope of deriving the behaviour of hadrons from an underlying field theory. At that time it seemed necessary to extract the utmost from the general principles of relativistic quantum mechanics, as the author's first book, *The Analytic S-Matrix* (written in collaboration with Eden, Landshoff and Olive, and hence commonly known as "ELOP"), is clearly described.

This new book, describing as it does the fruits of a research programme which developed out of the philosophy expounded in the earlier monograph, might well become known as *SPLOP*. ELOP, it shares with ELOP the quality of exposition for which the author is well known. The mathematical techniques which it presents will be of lasting value in the context of our increasing understanding of the field theoretical basis for models of high energy processes.

Peter Higgs

Peter Higgs is professor of theoretical physics at the University of Edinburgh.

BOOKS

Data - handle with care

Introduction to Multivariate Analysis
by C. Chatfield and A.J. Collins
Chapman & Hall, £13.00 and \$7.50
ISBN 0 412 160 30 7 and 16040 4

Using Humpty Dumpty's criterion that "when I make a word do a lot of work, I always put it extra" the words "multivariate analysis" could demand high wages. They may imply multiple regression (often incorrectly termed multivariate regression), the whole gamut of multivariate distribution theory or that uneasy mélange of technique and theory which this book covers. Interestingly, the word multivariate which used not to sell well has appeared regularly in recent textbook titles. The reason for the change from application-orientated or technique-orientated titles is not hard to find, for researchers tend to use multi-purpose statistical packages to analyse their data and recently the word "multivariate" has been introduced into a sub-program of a well known package with the result that many users are now going to be dragged unwillingly into the area.

Although the authors aim at both students and research workers the latter will almost certainly need to turn eventually to a more detailed work to supplement their own field of study. The authors do reference a number of books and papers but they seem to emphasize books similar to their own and to ignore certain areas of application. The book is most suitable

for students at final-year undergraduate level or, with some additional material on distribution theory, as a postgraduate textbook. Although dry in places it will appeal to the mathematically more able student without detracting from the fundamental idea that multivariate analysis is about analysing data.

The book has four general sections each preceded by a useful but brief preamble. It covers Hotelling's T², MANOVA, discriminant analysis, canonical correlation and variables, principal component and factor analysis, scaling and clustering. Each chapter, excluding that on factor analysis, is followed by a set of exercises. An introductory section includes some general advice on data handling. Unusually there are no statistical tables but then these are becoming increasingly redundant.

Any criticism perhaps stems from the obvious evolution of the book from a well presented course in that it is occasionally dogmatic to the point of infallibility. Most notable is the treatment of factor analysis where the mathematics is presented fairly enough but the subject and its applications are summarily dismissed. No mention is made of where an accepted biological model or random effects MANOVA leads naturally to a structured covariance matrix or to latent structure. Nor to the views of those who consider the factor score loadings to be no less heuristic than principal components.

The useful but simplistic view of data

scanning in the introduction could lead to disillusion given a large data set having both sample and attribute structure. The re-arranged correlation matrix on page 46 where predetermined attribute structure gives the result immediately cannot indicate adequately the confusion of spurious correlations induced by unequal sample sizes within a non-homogeneous population.

There are other oddities: the somewhat cavalier treatment on page 149 of a covariable in a MANOVA as though it were a yield with only the brief comment that "it is usually treated as a covariable" might trap an unwary experimenter. A whole page is devoted to Stein shrinkage estimators yet no mention is made of the robust estimators currently finding their way into the better packages.

But these quibbles are really fairly minor. Like the non-conformal matrix partition following equation 6.17, they do not really detract from what will prove a very useful book. The layout is particularly clear with section, equation and example numbering mercifully devoid of the excessive use of bold-face and decimals favoured by some recent publications. At its price it will undoubtedly prove a bestseller and can be recommended.

Colin P. Chalmers

Colin P. Chalmers is senior lecturer in statistics at Birkbeck College, University of London.

Estimates and hypotheses

Intermediate Mathematical Statistics
by G. P. Beaumont
Chapman & Hall, £5.95
ISBN 0 412 15480 3

This is a sound and reasonably priced text covering the theory of estimation and hypothesis testing at a level suitable for advanced undergraduates or commencing postgraduates. Basic theory of probability, random variables and distributions is assumed and the development, though starting from scratch, is in general terms and will be better understood by students already acquainted with the fundamentals of inference and the usual normal theory results.

Following a brief preview, the material is divided into seven chapters, of which the first develops sufficiency as a rationale for summarizing data without loss of information. Chapter two completes the discussion of classical criteria for point estimation, including unbiasedness, minimum variance bounds and completeness. Next follows an exposition of decision theory and Bayesian methods, including loss functions, randomized and non-randomized decisions, prior and posterior distributions, and a section on conjugate distributions and the role of

sufficient statistics. Finally, decision functions and the relationship of admissibility and minimax criteria to Bayes estimators are discussed.

Chapter four begins with estimation of one or more parameters by maximum likelihood, including the usual asymptotic theory for large samples and a helpful section on approximate iterative methods for finding estimates. The method of least squares is also covered for the case of linear models of full rank, although the standard multiple regression and analysis of variance structures are not discussed.

Next come two chapters dealing extensively with hypothesis testing. The introductory formulation in terms of random tests is not the easiest, however, and prior familiarity with basic Neyman-Pearson theory will help here. The relationship with decision theory is dealt with well, but again the development of theory for two-sided alternatives to an initial composite null hypothesis which specifies an interval for the parameter may be a little difficult to follow. Similar tests, multiparameter problems, likelihood-ratio and Bayes tests are also covered.

Chapter seven explores interval estimation from the Bayesian and classical view-

points and mentions most selective limits, relationships with hypothesis testing, and discrete distributions, ending with a discussion for large samples. Summarizing appendices deal with generating functions, transformations and order statistics, and the regular exponential family of distributions, both with examples. The book ends with about 30 exercises (in addition to those usefully provided throughout the text), to which outline solutions are given.

In general, the text is clear and (almost too) concise, although students might have appreciated more pictorial illustrations. Notation is clear, although a few equations and statements are awkwardly split between lines; misprints are rare. Opinions about what to include or leave out inevitably vary, but it should be noted that ancillary statistics are not mentioned, nor are fiducial inference, the method of moments or support intervals; more generally, the concept of robustness is not discussed. Nevertheless, the topics covered are accurately and succinctly presented, and so for the intended readership, this book can be recommended.

K. L. Q. Read

K. L. Q. Read is lecturer in mathematical statistics at the University of Exeter.

Biting the quantum apple

Principles of Quantum Mechanics
by Ramamurti Shankar
Plenum Press, \$29.50
ISBN 0 306 46397 8

To give a book the same name as Dirac's classic text is close to sacrilege: it cannot possibly be that good. Nevertheless, this book does have many good features, as well as others that I do not like at all. To oversimplify a little, I find that the first quarter of it is ill-judged, but the rest is very good.

It is almost inevitable that anyone who has to tackle the problem of introducing students to quantum mechanics will, as the years go by, come to believe strongly in a particular approach. My own experience has been that it is effective to begin with a short course in which the mathematics is kept as simple as possible. Only when the students have begun to be a little familiar with the new physical ideas, which are so far outside their previous intuition and "experience", should they begin on a more thorough and formal course.

Dr Shankar has very different ideas. Indeed, it is only on page 111 that he even starts the quantum mechanics. Before that, the student is asked to work through a chapter on vector space theory (he is told that this will need six to eight hours) and another on formal classical mechanics. And when he at last reaches the quantum mechanics, he is expected to

follow a "postulatory approach", which to the novice can be nothing but obscure. But it is interesting to find, a little further on, the disarmingly honest admission that "no matter how diligently the postulates are constructed, they must often be supplemented by intuition and classical ideas".

So, although the author wrote the book for those with no familiarity with the subject, it is the student who already has a little knowledge that will find it most useful. All the standard elementary applications are carefully explained. The general atmosphere is one of enthusiasm: "Once we have bitten the quantum apple, our loss of innocence is permanent" and "I will put the harmonic oscillator in its place - or a pedestal!". This is the sort of place that a good lecturer uses to keep the attention of his audience; it is not found so often in books, but it is fine provided that it is not overdone.

Particularly useful is the chapter on the path integral formulation of quantum mechanics. This is not usually found in basic texts, but it is right that nowadays it should be. Now that the approach is becoming so vital for work in quantum field theory and in statistical mechanics, it is valuable for students to get used to it early on.

There is a very full discussion of angular momentum and the addition of angular momentum. This includes irreducible tensor operators and the Wigner-Eckart theorem, which again are beyond the scope of most

introductory texts. Undergraduate courses in most British universities do not get as far as this, but the material is vital for anyone who is going to go on to apply quantum mechanics to real problems. The formalism is not difficult but, inevitably, students tend to feel a bit overwhelmed by it at first.

The book gets as far as the quantization of the electromagnetic field (in the Coulomb gauge). Traditionally, quantum physicists tend to use e.g.s. units, and Shankar follows this tradition. Perhaps we feel that centimetres are more appropriate than metres for describing objects as small as atoms and nuclei. But it is not time that we recognized that classical electromagnetism is now almost universally taught in S.I. units, and that there is really very little to be gained by students having to learn Maxwell's equations in a new form when they come to use them in quantum physics?

The final chapter introduces the Dirac equation. Anybody who works carefully through right to the end of the book will be very well prepared for postgraduate study in quantum physics.

Peter Laithshoff

Peter Laithshoff is reader in mathematical physics at the University of Cambridge.

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THES/81

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THE TIMES HIGHER EDUCATION SUPPLEMENT

The next Maths and Physics book number is planned for publication on November 13.

BOOKS

Science in a security fence

Reminiscences of Los Alamos, 1943-1945
edited by Lawrence Badash, Joseph O. Hirschfelder and Herbert P. Brodwin
D. Reidel, Dfl 50.00 and Dfl 20.00
ISBN 90 277 1097 X and 1098 8

The greatest threat to the survival of our civilization - perhaps even of mankind - comes undoubtedly from the nuclear arms race between the United States and the Soviet Union. However, few people are aware that before this there was a nuclear arms race, in which our competitor was Nazi Germany. The fear of many scientists in the United States and in Britain that the Germans might develop the atom bomb and use it to win the war, was the *raison d'être* for the hectic activities in the Manhattan project, to beat the Germans in this deadly race. The scientists with a pricking conscience about working on a weapon of mass destruction, rationalized it with the now familiar argument of deterrence: the bomb they were making was intended not to be used but to deter the enemy from using theirs.

As it turned out, the Germans never really engaged in the atom bomb project; in any case, Los Alamos was not ready with the bomb until after the Germans were defeated. None the less, the project proceeded on its own momentum and even two atom bombs were actually used, even though nobody suggested that the Japanese were even thinking about nuclear weapons. Was this necessary to reduce further American casualties? Some hold the view that Japan was on the verge of surrender even without Hiroshima and Nagasaki. Others, even more implausible, say that if the tremendous scientific and technological effort of the Manhattan project were applied directly to the war, it might have been won much earlier. Be that as it may, the only safe conclusion one can draw is that if one enters into an arms race, then sooner or later the arms will be used.

These reflections were prompted by the reading of this book, a collection of essays by ten of the temporary inhabitants of the mesa overlooking the canyon of the Rio Grande in New Mexico. Los Alamos, the birthplace of the atom bomb, has earned for itself a unique importance in the history of mankind, even though one of its outcomes may be to ensure that this history will not be a long one. Many books have already been written about it, by authors ranging from the military commander of the whole project to a native New Mexican. The British public had a fair glimpse of life in Los Alamos in the Oppenheimer series recently shown on BBC television. But the fascination for Los Alamos is so great that there will always be an avidity for any scrap of information.

The book does indeed fall into the category of a scrapbook, with its very fragmentary and uneven style and standard. The 10 essays were written by five scientists, three wives of scientists, and two military persons. Like the authors, the text is an assortment of technical



Scientists working inside the temporary tent set up at Point Zero, Los Alamos, perform the delicate operation of placing the core into the depths of the very first atomic bomb's explosive assembly in July, 1945. This still is taken from a recently declassified film and appears in Peter Goodchild's companion book to the BBC television series, J. Robert Oppenheimer: shatterer of worlds (BBC publications, £9.95), reviewed in these pages on February 27th, 1981.

discourse and title-tattle. Some essays describe in great detail highly specialized bits of apparatus, unlikely to interest many readers. The tales by the housewives are much more lively, because they talk about themselves and their husbands as human beings, but I cannot judge how true this would excite the reader. To me, who knew all the scientists and most of their families, any name mentioned in the book immediately evokes an image of a live person, while for the average reader it may be just a name.

I found Richard Feynman's essay "Los Alamos from below" the most fascinating one: it is worth buying the book for this chapter alone. Feynman was at that time a very young man, but it was obvious to anyone who met him that he was destined for a great career in science (he got his Physics Nobel Prize in 1965). But he has always been an *enfant terrible* with a particular penchant for debunking bureaucracy and bumbledom. His chapter contains a hilarious description of how he managed to learn the combinations of the safety locks on every filing cabinet in the technical area; once he was asked officially to open the safe containing urgently needed papers when the owner could not be located. He made mockery of the censorship of letters which was introduced in Los Alamos, and played havoc with the system of checking the entrance of persons into the area, by repeatedly entering through the gate post but not leaving through it, because he found a hole in the fence surrounding the whole town.

The hole in the fence is mentioned by several authors and I cannot resist adding my own bit. I was living with the Chadwicks, and one Sunday Lady Chadwick with her twin daughters and myself went

for a long walk, having of course gone legitimately through the gate post. On the bits of apparatus, unlikely to interest many readers. The tales by the housewives are much more lively, because they talk about themselves and their husbands as human beings, but I cannot judge how true this would excite the reader. To me, who knew all the scientists and most of their families, any name mentioned in the book immediately evokes an image of a live person, while for the average reader it may be just a name.

The GIs were trigger happy and looking for an excuse for action, because they were a selected bunch of soldiers who volunteered for special duties - meaning active service - and instead found themselves guarding civilians, and babysitting. I still shudder when I think of the narrow escape from an international incident if the wife of the leader of the British team were caught perpetrating an illegal act and shot in the posterior.

The hole in the fence has a symbolic meaning. Knowledge cannot be fenced in; but the question is, should it be acquired by crawling on all fours or by standing upright? All the security did not prevent Klaus Fuchs from giving the Russians important information. It is debatable whether this has made much difference to the time of completion of the first Russian atom bomb, but even if it did, does it matter, when one looks at it from the perspective of a few decades? If the advice given by Niels Bohr to Churchill were heeded, and the Russians were officially told about the Manhattan project before the bomb was used, perhaps we might have reached an agreement on how to control jointly this awesome discovery. But, alas, the great Bohr was nearly lured by a "dangerous foreign agent," the fence around Los Alamos was maintained, and we ended up with a nuclear arms race which - as said at the beginning - may bring our civilization to an untimely death.

Joseph Rotblat

Joseph Rotblat is emeritus professor of physics in the University of London at St Bartholomew's Hospital Medical College.

Pioneers of Science: Nobel prize winners in physics, by Robert L. Weber, has been published by The Institute of Physics, at £9.95. A chronological collection of short and discrete biographies of the 114 scientists and women who have been awarded the prize for discovery or invention in physics, the book describes in a tantalizingly brief manner the physicist's personal background and the significance of their achievements for twentieth-century physics. Each vignette was seen and approved by the laureates themselves.

Nuclear paranoia

The Greatest Power on Earth: the story of nuclear fission
by Ronald W. Clark
Sidgwick & Jackson, £8.95
ISBN 0 283 98715 4

The secrets of the atomic nucleus have always been considered among the most esoteric in the whole canon of science. But the secrets of the atomic nucleus are an open book compared to the secrets of the atomic politicians.

The well-known potential barrier around a heavy nucleus is practically transparent by comparison with the wall that surrounds nuclear policy. The phenomenon has been observed - albeit with extreme difficulty - for more than 40 years, virtually from the electrifying few months in 1938 when a scattered handful of brilliant scientists first identified the fission of the uranium nucleus.

The wall around nuclear policy-making is as high today as it was 40 years ago: here in Britain, within the past year, we have seen the present Prime Minister and a few senior Cabinet colleagues decide in secret to commit Britain to spending at least £5 billion on a new generation of nuclear weapons, the Trident system; and we have learnt that the previous Labour government actually began spending public money on underground nuclear testing in the US for this new generation of weapons even before the secret decision was taken to order them.

It is, of course, this pathological pattern of secrecy which has always been drawn tightly around nuclear activities which has given them the aura of the esoteric. The technology is no more complex than many others with which we play happily every day - colour television is an obvious example, pocket calculators another. But nuclear technology makes people uneasy - and with good reason: because it unerringly brings out the worst in political leaders in a way that no other technology has ever been seen to do.

Twenty years ago, Ronald Clark published a book entitled *The Bomb*. It bore the subtitle, *Britain's part in the weapon that changed the world*. One of the stimuli which prompted him to write the book being to counter the then prevalent impression that the atom bomb had been developed more or less unaided by the United States. While doing the research for this earlier book, Clark had the opportunity to meet and speak to many of the key people in the story of nuclear fission: Otto Hahn, Hans Halban, Lev Kowarski, John Cockcroft, Otto Frisch - all alas since deceased. Clark has now returned to the topic, to bring the story up to date. As might be expected, he draws extensively on the material from his earlier book; the new one recounts many of the vivid personal vignettes which make up the earlier book a modest classic of popular science writing. But his new book goes much farther, and much deeper, into the murky shadowlands of distrust and deception which descended even as the physical curtain of the uranium nucleus was being drawn aside for the first time.

Clark describes the familiar story of the research in the 1930s which broke open the secret of the nucleus; the Frisch-Polier memorandum; the MAUD committee; the Szilard-Einstein letter; the frankly desultory efforts in the United States, and the distinctly more urgent efforts in Britain in 1940-41; and the narrowing eyes and quickening pulses of the top political leaders as the ever more possible prospect of the atomic bomb came into the world. He discusses with numerous quotations some of the documents only recently declassified, the devilish in-fighting between ostensible allies - Churchill, Roosevelt and their advisors, the Canadians, the French, the Russians - which poisoned the well of nuclear energy even before any had drunk from it. He delineates with many depressing examples the seeming impossibility for politicians and governments to deal openly and honestly with nuclear issues, a habit well established before the end of World War II, which has persisted ever since, and into the civil twilight of nuclear energy far too often. In the light of secrecy, the British nuclear establishment must be counted

among the most secretive in the world.

Clark describes the extraordinary episode in 1941 when ICI made what amounted to a takeover bid for the British nuclear effort, with an eye to its postwar potential for power production. This conviction on the part of the British nuclear community, that civil nuclear energy would

ultimately prove to be a money-spinner, has now prevailed for 40 years, despite decades of evidence to the contrary. Nevertheless, this concern for huge nuclear profits was by no means the last of the irritants between Britain and the United States during World War II. In American fear that Britain would use commercial advantage of American related nuclear work was one of the primary reasons why the Americans aggressively shut the British out of the Manhattan Project. When the Americans learned that the leading French scientist had actually patented some nuclear processes the Americans became even more close-mouthed than ever.

Not was this distrust strictly between governments. Clark quotes a startling memorandum from Churchill to Lord Cherwell about Niels Bohr, one of the greatest scientists of the century, by figure in nuclear history and a man of standing personal courage and integrity. The President [Roosevelt] and I was much worried about Professor Bohr. How did he come into this business? It is a great advocate of public life made an unauthorized disclosure to Chief Justice [sic] Frankefort.

Clark's earlier book was a masterpiece of clarity and insight. He knew all the details. He says he is a close correspondence with a Russian professor, an old friend of his is Hans Halban, who has written about the matter and may be writing his book. The Russian professor has urged him to write a book in order to disseminate what is all this about? It seems to me Bohr ought to be confined or at least made to see that he is very near the edge of mortal crimes. I did not like the man when I saw him at the Downing Street. Let me have your views about this man. I do not like it at all.

After the war's end the paranoia, I suppose, increased. The British desire to develop nuclear weapons was then precisely six people. The first Soviet explosion in 1949 undercut opposition in the United States to development of the hydrogen bomb; and so it went on and there are at least six nations with nuclear weapons, and at least a dozen with the capability to produce them at will.

Clark makes it clear that the political beliefs from the outset, and still believe that nuclear weapons are weapons of unparalleled political power. But if they seem to have forgotten the physical power of nuclear weapons. As the nuclear sabre-rattling grows ever more hysterical it is possible to succumb to a desperate temptation to renew a proposal from a French Report of 1945: that we put together the Reagans and Thatchers and Brezhnev and Gorbachev heads of state from every corner of the globe to the World included, transport them to a deserted island, and there for their enlightenment, detonate one thermonuclear warhead in the atmosphere, to reveal to them what they are playing with.

As Clark tells "the story of nuclear fission" the tone of his fluent, absorbing prose grows ever more somber, with flashes of biting insight. He defines "proliferation" as "the acquisition by nuclear powers of the nuclear weapons which already has oneself". This concept appears, with suitably ironic symbolism, in the development of the hydrogen bomb, which further strains on of shape by the already bent-out of shape by the atomic bomb programme, Clark reflects: "thought often flies out of the window when the door" - a point worth remembering the next time a nuclear advocate declares no fear of criticism as "emotional".

The substance and tenor of Clark's book evokes, inescapably, another political metaphor: the uncertainty principle. In nuclear physics, the more we know about the whole, the more major policy decisions and events; and the nuclear uncertainty we now face may be the last uncertainty.

Walter C. Patterson

Walter C. Patterson is international editor of the Bulletin of the Atomic Scientists.

A new edition (with a brief resume of the life after the age of 42) of the autobiography of Leopold Infeld, a theoretical physicist, associate of Einstein, and Polish émigré, has been published by the Corgi Publishing Company of New York in *Quantum Autobiography*, at \$14.95.

NOTICE BOARD

Chairs

A Robert Ogilvie Buchanan Chair of Geography Education has been established at the University of London Institute of Education and Professor Norman Graves, who previously held the conferred title of Professor of Education, has been appointed to the new chair. The establishment of this chair is in recognition of the very great contribution that Professor Buchanan made to the development of geography education and to the work of the University of London and the Institute of Education. Professor Robert Ogilvie Buchanan died on July 9, 1980 at the age of 85, shortly after his official retirement from a long association with the Institute.

Appointments

Universities
Bath: fellow in engineering: Professor Joseph Black (school of engineering).
Birmingham: head of the department of chemistry: Professor J.C. Robb.
Zimbabwe: senior lecturer: R. Hume (child life and health); N.C. Wilson (clinical surgery temporary); J.D. McGregor (pathology, temporary part-time); J.A. Survis (pathology, temporary); J.A. Hammond (tropical animal health, temporary).
Lecturers: R. Ferguson, M.J. Macleod, C. Ross A. Young (architecture, part-time); J. Hood (paediatrics); Miss B.J.D. Oates (child life and health); J.D. Hayes J.E. Routledge (clinical chemistry); A.J. Munro (clinical oncology); Miss H.A. Kellie (medicine); G.D. Smith (pathology); Miss R.A. Johnson (sociology part-time); I. Hays (urban design and regional planning, part-time); D. McGovern (urban design and regional planning, part-time); R.G.H. Turnbull (urban design and regional planning, part-time); Miss L.A. Holmes (veterinary practice teaching unit, large animal).

Temporary lecturers B.A. Greene (L.R. Lane agriculture); L.N.J. Archer (child life and health); J.P. Gray (computer science, part-time); I. Hansen and M.H.P. Waring (computer science); R.A. Hardie (dermatology); D.S. Dunner and D.W. Crosthwaite (forensic medicine, part-time); B.S. Duffield (geography); M. Nicolson (history, medicine and science unit Wellcome Trust); S. Malik (medicine); R.M. Edelson (and Miss R.M. Gatenby (medical anatomy); J.K. Dunn. Kent: Wellfield science research fellow Dr. B.T. Heston. Leicester: Senior lecturer: Dr. Van Douglas Young (genetic counselling in the department of child health). Oxford: Junior research fellows: at Merton College Stuart Richard Aldis; David Arthur Hume; David Graham McArdney. Southampton: Hartley fellows: Dr. G.J.M. Hiron (biology); Dr. A. Offer (history). Southampton: Conference officer: John Hiett. Wales, Aberystwyth: Honorary College fellows: Dr. A.B. Barnes (applied mathematics); John Bruce (Welsh Joint Education Committee); Dr. P.T. Davies (statistics); Dr. M.A. Nettleton (physics).

Open University programmes March 28 to April 3

Saturday March 28

10.00 Contemporary issues in education: Let There Be Music (E200); part 9.
10.15 Mechanics and applied calculus: Newton's Laws (M232); part 3.
10.30 Art foundation course: Interpreting a Dream (A101); part 9.
10.45 Politics, people and administration: The Client (D216); part 9.
11.00 An agency population: Work and Retirement (P232); part 2.
11.15 Seventeenth century England: a changing culture: Women Beware Women Without Court Masque (A203); part 4.
11.30 Instrumentation: Pressure Transducers (T291); part 3.
11.45 Systems modelling: Linear Transforms: A Case Study (T241); part 2.
12.00 The Enlightenment: A Little Gothic Castle (A204); part 9.
12.15 Science and belief: from Darwin to Einstein: Lord Kelvin's Clock (A381); part 1.
12.30 History from and function: Enzyme Structure and Function (E202); part 6.
12.45 Genetics: Mendel's (S299); part 9.
13.00 Biology, brain and behaviour: Psychology: Overview of Behaviour (E236); part 2.
13.15 The Earth's structure composition and evolution: Crust and Mantle (S237); part 3.

RADIO 4 (VHF)
8.00 History of architecture and design 1890-1939: Lord Sullivan (A205); part 7.
8.15 Personality and learning: How Will Art Sit Still? (E201); part 9.
8.30 Reading development: Close Proximity (P231); part 2.
8.45 Environment, control and public health: Water Observation: Water and Public Health (P232); part 2.
9.00 Art foundation course: Studying literature (A101); part 9.
9.15 Science foundation course: The Reaction to Wagner (S101); part 3.

RADIO 4 (VHF)
8.00 Biochemistry and molecular biology: Industrial Revolution of Polymers (S232); part 3.
8.15 The digital computer: Computer Structures (D221); part 9.
8.30 Art in Italy 1480-1580: Portraiture (A352); part 3.
8.45 World politics: Power and State Behaviour (D223); part 3.
8.50 Learning and society: Education for Service (E202); part 3.
9.00 Decision making in Britain: Why do we Keep the Law? (D203); part 7.
9.15 Research methods in education and the social sciences: Social Class (D204); part 6.

Sunday March 29
8.00 Art in Italy 1480-1580: Portraiture (A352); part 3.
8.15 World politics: Power and State Behaviour (D223); part 3.
8.30 Learning and society: Education for Service (E202); part 3.
8.45 Decision making in Britain: Why do we Keep the Law? (D203); part 7.
8.50 Research methods in education and the social sciences: Social Class (D204); part 6.

8.05 Making sense of society: Hockett's Design Features of Communication (P231); part 7.
8.20 Statistics: an introductory approach: The Binomial Distribution (M274); part 3.
8.45 Environmental control and public health: Water conservation: Water for Oxford (P232); part 2.
9.00 Art foundation course: Interpreting a Dream (A101); part 9.
9.15 Politics, people and administration: The Client (D216); part 9.
9.30 Problem identification Games (T262); part 2.
9.45 Technology for teachers: Energy (P271); part 2.
10.00 People and work: Steel (DE351); part 3.
10.15 Social psychology: Cognitive Maps (D305); part 3.
10.30 Cognitive psychology: Poppy (D310); part 3.
10.45 Fundamentals of human geography: Simple Ecological Problems of Population (D204); part 4.
10.50 Geography: Site 167, Deep Sea Drilling Project (S234); part 3.
11.00 Ecology: Woodland Decomposers (S232); part 3.

RADIO 3 (VHF)
8.00 Language in use: Men, Women and Language (S234); part 3.
8.15 Curriculum design and development: The Baby Street Kids (E203); part 3.
8.30 Patterns of inequality: Sleeping the Lophophore (D202); part 9.
8.45 Modern art from 1848 to the present: styles and social implications: Cézanne's "Bathers" (A351); part 3.
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9.30 Research methods in education and the social sciences: Social Class (D204); part 6.

Honorary degrees

Heriot Watt
The following will be awarded honorary degrees in May and November:
DSc: Sir Terence Beckett, director-general of the CBI, Professor David John Finney, professor of statistics at the University of Edinburgh, Professor John Currie Gunn, Cargill professor of natural philosophy, Glasgow University, Dr Derek H. Pingle, chairman and managing director of Scientific and Electronic Enterprises Ltd.
DLitt: Mr Sean Connery, actor, Mr William D.C. Lyddon, chief planning officer, Scottish Development Department, Mr Paul Henry Mueller, chairman of the Credit Policy Committee, City Bank NA, New York.
DUniv: His Eminence Cardinal Gordon J. Gray, Roman Catholic Archbishop of St Andrews and Edinburgh.

Appointments

Universities
Bath: fellow in engineering: Professor Joseph Black (school of engineering).
Birmingham: head of the department of chemistry: Professor J.C. Robb.
Zimbabwe: senior lecturer: R. Hume (child life and health); N.C. Wilson (clinical surgery temporary); J.D. McGregor (pathology, temporary part-time); J.A. Survis (pathology, temporary); J.A. Hammond (tropical animal health, temporary).
Lecturers: R. Ferguson, M.J. Macleod, C. Ross A. Young (architecture, part-time); J. Hood (paediatrics); Miss B.J.D. Oates (child life and health); J.D. Hayes J.E. Routledge (clinical chemistry); A.J. Munro (clinical oncology); Miss H.A. Kellie (medicine); G.D. Smith (pathology); Miss R.A. Johnson (sociology part-time); I. Hays (urban design and regional planning, part-time); D. McGovern (urban design and regional planning, part-time); R.G.H. Turnbull (urban design and regional planning, part-time); Miss L.A. Holmes (veterinary practice teaching unit, large animal).

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Open University programmes March 28 to April 3

Saturday March 28

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10.15 Mechanics and applied calculus: Newton's Laws (M232); part 3.
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8.50 Learning and society: Education for Service (E202); part 3.
9.00 Decision making in Britain: Why do we Keep the Law? (D203); part 7.
9.15 Research methods in education and the social sciences: Social Class (D204); part 6.

Sunday March 29
8.00 Art in Italy 1480-1580: Portraiture (A352); part 3.
8.15 World politics: Power and State Behaviour (D223); part 3.
8.30 Learning and society: Education for Service (E202); part 3.
8.45 Decision making in Britain: Why do we Keep the Law? (D203); part 7.
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Wednesday April 1

8.00 Environmental control and public health: Water conservation: Water for Oxford (P232); part 2.
8.15 Mechanics and applied calculus: Newton's Laws (M232); part 3.
8.30 Art foundation course: Interpreting a Dream (A101); part 9.
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9.00 Problem identification Games (T262); part 2.
9.15 Technology for teachers: Energy (P271); part 2.
9.30 People and work: Steel (DE351); part 3.
9.45 Social psychology: Cognitive Maps (D305); part 3.
10.00 Cognitive psychology: Poppy (D310); part 3.
10.15 Fundamentals of human geography: Simple Ecological Problems of Population (D204); part 4.
10.30 Geography: Site 167, Deep Sea Drilling Project (S234); part 3.
11.00 Ecology: Woodland Decomposers (S232); part 3.

RADIO 3 (VHF)
8.00 Language in use: Men, Women and Language (S234); part 3.
8.15 Curriculum design and development: The Baby Street Kids (E203); part 3.
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Thursday April 2

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Noticeboard is compiled by Patricia Santinelli and Milla Goldie

and the National Radiological Protection Board and chancellor of the University of Sheffield. Lidi Lord Scarman, Lord of Appeal in Ordinary and chancellor of the University of Warwick.

St Andrews
The following are to be awarded honorary degrees in July:
DLitt: Dr Sir Kenneth Dover, former professor of Greek at the university, Mr W.E.K. Anderson, headmaster of Eton.
DSc: Professor Michael Atiyah, holder of the Royal Society chair of mathematics at Oxford University, Professor Luna B. Leopold, professor of geology at the University of California, Berkeley.
Lidi: Mr Robert S. McNamara, president of the World Bank.
DD: Professor Martin Hengel, holder of the chair in New Testament and Classical Jewish Studies at the University of Tübingen.

Stirling
DUniv: Mr Norman MacCarg, Scottish poet and former reader in poetry at the university.

"Teacher Education in the 1980s and 1990s" a conference organised by the School of Education and Humanities at North East London Polytechnic is to be held from April 10-16 at the Danbury Park Conference Centre, Chesham, Essex. The central purpose of the seminar is an examination of models of initial or pre-service teacher education and in-service teacher training within the context of the changing needs of the next two decades are likely to bring. Further details from Colin Bailey, School of Education and Humanities, NELP, Longbridge Road, Dagenham, Essex.

"Management of Multiple Trauma", the A.B. Mitchell memorial lecture is to be delivered by Professor Martin Aitken, of the University of Basel, Switzerland on April 3 at 11.30am in the Sir William Wallis Hall, Queens University, Belfast. Admission free.

Open University programmes March 28 to April 3

Saturday March 28

10.00 Contemporary issues in education: Let There Be Music (E200); part 9.
10.15 Mechanics and applied calculus: Newton's Laws (M2

Colleges of Higher Education continued



Roehampton Institute

Digby Stuart
Froebel
Southlands
Whitelands

Courses offered by the Roehampton Institute of Higher Education are in combined studies leading to university first and higher degrees. The Institute now seeks to make the following FIXED-TERM appointments as soon as possible for the period 1 September 1981 to 31 August 1982—

LIU/SL IN DRAMA

Candidates should possess a first degree in English and/or Drama, a higher degree, teaching and/or research experience in Elizabethan/Jacobean drama.
Salary: £8482 - £12,141 plus London Allowance £750.
Further particulars and application forms may be obtained from R. A. Fennell, Assistant Secretary, Roehampton Institute of Higher Education, Richmond Building, Digby Stuart College, Roehampton Lane, London SW16 6PH.
Closing date for receipt of applications: 22 April 1981.

THES8



the College of Ripon & York St John

APPOINTMENT OF LECTURER GRADE II

Applications are invited from well qualified graduates or graduate equivalents for the following post in this Church of England Voluntary College of Higher Education (1700 men and women) which offers courses validated by the University of Leeds. The appointment will be for 1 September 1981 and will be at an appropriate point on the Lecturer Grade II Scale (£8,012-£9,702).

DEPARTMENT OF HISTORICAL STUDIES LECTURER GRADE II (HISTORICAL STUDIES)

Competences in American Studies is necessary, preferably with a range of knowledge of both History and Literature. Further details of the above post and application forms may be obtained from the Principal, The College of Ripon and York St. John, Lord Mayor's Walk, York YO3 7EX, to whom completed forms should be returned to arrive not later than MONDAY 20th April 1981.

THES8

COUNTY OF AYON BATH COLLEGE OF HIGHER EDUCATION

Applications are invited for three temporary appointments as Lecturers Grade II, for one year from 1st September 1981, in:

1. Home Economics
2. Music
3. Sociology

Applicants for posts 1 and 2 should have good experience of teaching in schools and be able to contribute to the academic and professional elements of the subject in B.Ed. Degree courses. Applicants for post 3 should be able to contribute to the teaching of sociology in B.Ed. and B.Sc. Honours Degrees. The appointments are to replace members of staff granted Study Leave during the year 1981-82. Further particulars may be obtained from the Principal, Bath College of Higher Education, Newton Park, Newton St. Loe, Bath, BA2 9BN, to whom applications (not forms) with names of three referees, should be submitted by 13th April 1981. Salary, according to the Bathman Scale for Further Education, at present £6,012 to £9,702 but subject to review from 1st April 1981.

THES8

CANTERBURY CHRIST CHURCH COLLEGE OF HIGHER EDUCATION

COLLEGE CHAPLAIN

Applications are invited for the post of Chaplain at this Church of England College of Higher Education which offers BA, BEd, BSc, advanced Diplomas and higher degrees in Education. The post will be resident and candidates may or may not be required to contribute to the college teaching programme. Further details available from Mrs. Jean Long, College Secretary to whom applications should be sent not later than 10 April 1981.

THES8



NATIONAL INSTITUTE FOR HIGHER EDUCATION DUBLIN

The Institute, which is funded completely by Government, is the newest higher education institution in Ireland. It began six undergraduate degree programmes in Autumn 1980 in its Faculties of Business, Science, Engineering, Communication & Human Studies, and Education Studies. Its plan for further development anticipates a growth to 5,000 student places by 1991 including programmes at postgraduate and diploma level in addition to further first degree courses.

Two challenging positions exist for experienced and well qualified people to assist in the work of this newly established Institute.

Head of School of Staff Development

who will have responsibility for identifying and meeting Staff Development needs across the full range of academic and administrative personnel at the Institute.

Lecturer

who will assist in making the Services of the School of Staff Development and the Curriculum Development and Educational Technology Units available within the Institute.

Both appointments will have substantial responsibility for the planning and provision of diploma/degree and in-service programmes and a high level of interpersonal skills is required in addition to a substantive interest in research.

Salary Scale: Head of School: £11,952 - £15,788.

Lecturer: £9,569 - £14,316.

Applicants should submit full curriculum vitae, including the names of three referees, as soon as possible to the Personnel Department, National Institute for Higher Education, Glasnevin, Dublin 9, Ireland. Telephone: Dublin 373631.

Colleges of Further Education

Research

ROYAL ACADEMY OF MUSIC

Applications are invited for the post of

Part-time LECTURER IN PIANOFORTE

Part-time LECTURER IN MUSIC TECHNIQUES (Harmony, etc.)

The appointments will be for the 1st September, 1981, and will be for not less than ten hours contract work per week. The appointments will be within the range Lecturer II/Senior Lecturer for which the full-time salaries (subject to review) lie between £8,012 and £11,285 per annum. Further particulars may be obtained from the Administrator, Royal Academy of Music, Marylebone Road, London NW1 8HT, to whom applications should be addressed as to be received not later than 24th April 1981.

THES7

Administration

BRITISH POLYTECHNICS 'SPORTS ASSOCIATION'

Invites applications for the newly created post of

At the Association's General Office, situated at Birmingham

Responsibilities to include supervision and overall control of Central Office, including the administrative support services for the Association's various departments, including the Sports Association, British Polytechnics, etc.

Applicants should submit a curriculum vitae, including the names of three referees, as soon as possible to the Personnel Department, National Institute for Higher Education, Glasnevin, Dublin 9, Ireland. Telephone: Dublin 373631.

THES8

Awards

JAPAN FOUNDATION ENDOWMENT COMMITTEE

Grants and scholarships and

with a view to the advancement of the Japanese people in the United Kingdom.

The post will be resident and candidates may or may not be required to contribute to the college teaching programme.

Further details available from Mrs. Jean Long, College Secretary to whom applications should be sent not later than 10 April 1981.

THES8

RADIOACTIVE WASTE MANAGEMENT RESEARCH

1982/83

The Secretaries of State for the Environment, for Scotland and for Wales are responsible for UK policy on the management of civil nuclear waste. A substantial research and development programme is well established and the policy objectives for 1982/83 have now been drawn up.

There are four main categories:—

1. Waste conditioning research — the conversion of radioactive waste into forms suitable for safe storage and disposal.
2. Geological disposal research — geological and engineering aspects of radioactive waste disposal underground.
3. Oceanographic disposal research — oceanographic and engineering aspects of radioactive waste disposal at sea.
4. Systems and environmental research — including radiological assessments of waste disposal.

Any potential contractors interested in participating in the 1982/83 programme are invited to request full details and task specifications from: Miss L. Nathan, Department of the Environment, Room 417, Back East House, 1 Lambeth Palace Road, London SE1 7ER. Formal proposals should be returned to the Department by 30 April 1981.

Issued by the Department of the Environment on behalf of the Scottish Development Department and the Welsh Office.

THES10

SUNDERLAND POLYTECHNIC

FACULTY OF ENGINEERING

DEPARTMENT OF ELECTRIC AND CONTROL ENGINEERING

RESEARCHER 'A' (ASSISTANT)

Salary scale: £4,080 to £4,800 per annum (under review).

Applications are invited from suitably qualified persons to make a research contribution in the following areas:

Design of fast-acting power systems in collaboration with the Department of Electrical Engineering, University of Newcastle.

Power system compensation using digital techniques.

Direct digital control of multi-variable non-linear systems (e.g. D.C. link).

Candidates should hold or expect to gain a good honours degree or equivalent in Electrical Engineering or Control Engineering, or a related discipline.

The appointments are normally for three years, subject to satisfactory progress, and candidates will be expected to register for a higher degree.

An application form and full particulars may be obtained from the Personnel Officer, Sunderland Polytechnic, 72B, Clifton Road, Sunderland, S.S. 6 7BB. Closing date April 17, 1981.

THE POST IS FUNDED BY THE FIELD FOUNDATION. Applications should be sent to the Field Foundation, 10, St. James's Place, London SW1A 1HQ.

Particulars from the Registrar, University of the Pacific, 1000 University Avenue, Stockton, CA 95210, U.S.A.

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Overseas continued

Lecturers Singapore Polytechnic/Ngee Ann Technical College

Invite applications from suitably qualified persons for appointment as LECTURING STAFF in the following Divisions/Departments/Units:—

Ngee Ann Technical College

1. Mechanical Engineering
2. Building
3. Electrical & Electronics Engineering
4. Shipbuilding & Repair Technology
5. Business Studies
6. English Language
7. Computer
8. Mathematics & Science

The Institutions

The Singapore Polytechnic and Ngee Ann Technical College are premier Government technical institutions responsible for the training of technical engineers. Both institutions are financed by the Government of Singapore. The current annual operating budget for Singapore Polytechnic is \$227.3 million and for Ngee Ann Technical College \$510.9 million. The Singapore Polytechnic has a student enrolment of 8,500 (including a part-time enrolment of 3,500 students) and a full-time academic staff strength of 318. For Ngee Ann Technical College, the student enrolment is 2,480 and the full-time academic staff strength 193. The medium of instruction in both institutions is English.

Qualifications

Candidates should have an accepted university degree and/or professional qualifications in a relevant field and have at least 2 years relevant industrial/teaching experience.

Duties

In addition to teaching, successful candidates may be required to prepare students for external examinations, develop new courses or assist in departmental administration.

Gross Annual Emoluments

Gross annual emoluments for academic staff are as follows:—

Principal Lecturer: \$548,685-\$860,944
Senior Lecturer: \$334,762-\$540,846
Lecturer I: \$520,540-\$537,804
(The present rate of exchange is £1 : S\$4.86).

Points of entry into any of the above salary ranges will, however, depend on qualifications and experience.

either (a) Assistant Registrar (Personnel) Singapore Polytechnic, c/o Singapore High Commission, 2 Wilton Crescent, London SW1, U.K.
or (b) Assistant Registrar (Personnel) Ngee Ann Technical College c/o Singapore High Commission, 2 Wilton Crescent, London SW1, U.K.
giving their curriculum vitae, the subjects they are able to teach, and also the names and addresses of 2 referees. The closing date for receipt of applications is 10th April, 1981.

REPUBLIC OF SINGAPORE

T.S.12

UNIVERSITY OF MELBOURNE

Lectureship or Senior Lectureship

(Limited Tenure or Continuing) in the GRADUATE SCHOOL OF BUSINESS ADMINISTRATION

Applications are invited for appointment to a lectureship or senior lectureship in the Graduate School of Business Administration which forms part of the Faculty of Economics and Commerce.

While the position may result in an appointment as lecturer or senior lecturer level, the School's requirements are such that an appointment at the senior lecturer level is expected to be appropriate.

Applicants should be competent in the Business Policy/Strategy area with appropriate business experience and advanced academic qualifications. Competence in another area of Business Administration, especially Marketing, will be an added advantage. Teaching experience is desirable.

Salary is in the range: Lecturer AS19,132-AS25,132 and Senior Lecturer AS25,669-AS39,918 per annum.

Further information including details of application procedure and conditions of appointment is available from the Staff Officer, Applications referring to position number 211 004 should be addressed to the Staff Officer.

University of Melbourne,
Parkville, Vic. 3052,
Australia
and close to 24th April, 1981.

THES12

UNIVERSITY OF TRANSKEI

Chair in Psychology

Applications are invited from suitably qualified candidates for appointment to the above mentioned post.

The incumbent will be expected to take responsibility for the Department of Psychology, which incorporates General and Industrial Psychology. There is no restriction to any particular field of specialisation.

Salary Scale: R17,100 x 750 x 18,600 x 900 — 22,200 p.a. £1.00 = R1.75 (approx.).

Assumption of Duty: As soon as possible. Additional benefits include payment of removal of furniture and personal effects, assistance towards University education of children, accident insurance cover, study leave, leave gratuity on retirement and membership of Group Insurance, Pension and Medical Schemes.

Applications should reach the Registrar, University of Transkei, Private Bag X5092, Umtata, Republic of Transkei, Southern Africa, not later than 30 April, 1981. Applicants must furnish a curriculum vitae as well as full postal addresses of at least three (3) referees.

THES12

THEOLOGICAL HALL PRESBYTERIAN CHURCH OF NEW ZEALAND

Applications are invited for the position of Professor of Church History & History of Doctrine in the Theological Hall of the Presbyterian Church of New Zealand, located at Knox College, Dunedin.</

Zambia

Your skills will be welcomed and well rewarded in our young but fast-developing nation. We need your help in expanding further our education system and extending our education standards, and we are fully committed to the premise that education is the key to our future.

HEAD OF SECTION

Hotel and Catering

Requirements: a degree or HNC/HND with at least five years experience in the Hotel & Catering field. Teaching experience would be an asset.

Responsibilities: will involve teaching the academic section of the Department, including administration, discipline and, in consultation with the Hotel Industry, the curriculum development.

SENIOR LECTURERS

Metallurgy

Applicants should have a University degree in metallurgy or its equivalent, with at least four years of industrial experience in the field or three years of teaching experience.

The successful candidate will take a senior lecturing position in the Mining Department, assisting the Head in the preparation of students for technician and technology diplomas.

Process Instrumentation

Applicants should hold an engineering degree or HNC/HND in process control with several years of experience preferably in the maintenance area. Teaching qualification or experience would be a strong advantage.

The successful candidate will in addition to teaching, assist the Head of Department in the administrative duties of the process instrumentation classes and will supervise lecturers presenting classes in process instrumentation.

LECTURERS

Chef Training/Institutional Catering

Requirements: HCIMA Chef examination or equivalent or with at least three years experience in a similar capacity in a hotel, restaurant or large institution kitchen. Teaching experience would be an asset.

Responsibilities: Teaching of all aspects of hotel or institutional house-keeping.

Hotel and Tourism Services

Requirements: HCIMA examination with at least two years of post-training experience in the field as Tourist Instructor/Relations Officer in a college, hotel or tourist office.

Responsibilities: Teaching all aspects of hotel accommodation services and to develop studies in tourism for the department and industry.

Pharmacy

Applicants should have a University degree in Pharmacy or any recognised qualification in Pharmacy with registration as a pharmacist. At least three years of experience will be required, preferably in hospital dispensing. A teaching qualification or experience would be an asset.

The successful candidate will teach pharmacy in a three-year full time course leading to the Zambian diploma in pharmacy. One of the three years is spent in the field.

Physiotherapy

Applicants should have an appropriate, fully recognised qualification in physiotherapy with a minimum of three years of practical work experience.

The successful candidate will give theoretical and practical instruction in a three year full time course conducted partly at college and partly at the University Teaching Hospital leading to the Zambian diploma in physiotherapy.

Journalism

Feature writing * Reporting * Multimedia * Mass Communication

Applicants for these four posts should have a University degree in Journalism or in any subject of the liberal arts with a post-graduate degree or diploma in Journalism. Experience of not less than four years in the relevant field of journalism will be required. Teaching experience would be a distinct asset.

The successful candidates will teach various aspects of journalism to students preparing for a diploma in Journalism.

Financial Accountancy

Applicants should have a University degree in Business Studies or HNC/HND with specialisation in Financial Accountancy and not less than two years of work experience in industry or Government service. Teaching experience would be an asset.

Cost Accountancy

Applicants should have a University degree or HNC/HND or equivalent qualification with specialisation in financial accountancy. At least two years of work experience in this field will be required.

Marketing

Applicants should have HNC/HND or a degree in business studies with a diploma and a number of years experience in the field of marketing. Emphasis is placed on practical work and the successful candidate will be required to teach full time students on a three year diploma course.

Insurance

Applicants should have HNC/HND or a degree in business studies with a diploma and a number of years experience in the field of insurance. Emphasis is placed on practical work and the successful candidate will be required to teach full time students on a three year diploma course.

Transport Management

Applicants should have HNC/HND or a degree in business studies with a diploma and a number of years experience in the field of transport management. Emphasis is placed on practical work and the successful candidate will be required to teach full time students on a three year diploma course.

Refrigeration

HNC/HND or a full City and Guilds Technological certificate or equivalent in electrical or mechanical engineering, with an additional recognised qualification in refrigeration and air conditioning. At least three years of experience in the actual repair and maintenance of refrigeration equipment including the full range from household appliances to commercial and industrial equipment. Teaching experience would be an advantage.

The successful applicant will be required to teach refrigeration theory and practice to full time students preparing for a craft or technician certificate.

Metal Fabrication

Applicants should have HNC/HND or full City and Guilds Technological certificate or equivalent in metal fabrication with at least three years of industrial experience. A teaching qualification or experience would be an asset.

The successful candidate will be required to teach metal fabrication to full time students on

craft and technician programmes leading to Zambian certificates at these levels.

Quantity Surveying

Applicants should have a degree in the appropriate Civil Engineering field or a Technological diploma or equivalent in quantity surveying or Associate Membership of the Institute of Quantity Surveyors or its equivalent. At least two years of work experience in the field will be required. Teaching experience would be an advantage.

The successful candidate will be required to give instruction in quantity surveying to students on technician and technology programmes.

Land Surveying

Applicants should have a degree or a recognised technology diploma in Land Surveying with at least three years experience in the field. Teaching experience would be an asset.

The successful candidate will be required to teach Land Surveying to students on a full time course leading to a technician diploma in construction and Town and Country Planning programmes.

Town & Country Planning

Applicants should have a degree or equivalent in Town Planning or Architecture, with at least three years of industrial experience. Teaching experience would be a distinct advantage.

The successful candidate will be required to teach town planning and related subjects to students preparing for technician diplomas in Civil, architectural and town planning fields.

Mineral Processing

Applicants should hold a University degree in minerals engineering or a metallurgical qualification with a mineral engineering bias or HNC/HND in mineral engineering. At least two years of work experience will be needed in comminution and concentration of metallic ores.

The successful candidate will be expected to teach mineral engineering as well as other metallurgical and allied subjects such as hydrometallurgy, material handling, process control, metallurgical calculations and fluid mechanics to students preparing for a diploma in mining.

Metallurgy

Applicants should have a University degree or equivalent in metallurgy with at least three years of industrial experience. A teaching qualification or teaching experience would be an advantage.

The successful candidate will teach metallurgy to students preparing for the Zambian diploma in mining technology.

Instrumentation

Applicants should have a University degree in electricity or HNC/HND or equivalent in electricity with a bias for instrumentation. At least three years of industrial experience post qualification will be required or two years of teaching experience.

The successful candidate will teach electrical instrumentation to students studying for a diploma in process instrumentation.

Telecommunication

Applicants should have an engineering degree or HNC/HND in telecommunication engineering with at least three years of industrial experience in telephone industry with full telecommunication equipment, including installing, maintenance, trouble shooting and repair of multi-phase systems.

The successful candidate will be expected to teach telecommunication to students preparing for a technician diploma in this field.

Chemical Engineering

Applicants should hold a University degree or equivalent diploma in chemical engineering, or industrial chemistry or a related field, with at least three years of experience in a chemical industry. Teaching experience would be an asset.

The successful candidate will teach industrial chemistry in theory and practice to students in engineering technician and technology programmes.

Geology (Mining)

Applicants should have a University degree in Geology or Mining Engineering or a technological diploma or equivalent with at least three years of industrial experience in mining geology. Teaching experience would be an asset.

The successful candidate will give theoretical and practical instruction to students on technician and technology programmes, in elementary physical geology, structural and mining geology and mineralogy with application to the mining industry.

Aircraft Maintenance Engineering

(Engines and Air Frames)

Applicants should have a University degree in aeronautical engineering or HNC/HND or equivalent in Aircraft maintenance engineering with considerable and proven experience in the maintenance of aircraft and air frames. Teaching experience would be a distinct advantage.

The successful candidate who will be required to obtain an Aircraft maintenance licence while in Zambia, will be required to lecture to students who are on a full time course leading to a Zambian licence in Aircraft maintenance engineering. The lecturer will also help with the development and preparation of the syllabus and instructional material.

Aero/electronics

Applicants should have a University degree in electronics engineering or HNC/HND or equivalent in electronics with sound knowledge of electronics with special emphasis on the semi-conductor theory and application.

A minimum of four years proven experience will be required in telecommunications preferably with Civil Aviation or armed forces. In the installation of HQ, VHF, SSB, FSK, head and mobile services, tape recorders and remote control systems. Experience in Air navigation aids like VOR, ILS, VDF, GCA and NDB surveillance radar would be a big advantage.

Flying Instructor

Applicants should have a valid Commercial Pilot's Licence with full Instructor's and Instrument ratings. Applicants who are approved national examiners for the issue of pilot licences and instrument ratings have an advantage. Applicants should have extensive experience as flying instructors at national approved training establishments and should have not less than 1,500 flying hours of which at least 500 will be of flying instruction.

Candidates with Cessna 150/310 in ground and flying experience in Tropics and high altitude Air fields have an added advantage.

The successful candidate will train Zambian student pilots from ab initio to Commercial Pilot's Licence standard with instrument ratings. Salaries will relate to qualifications and experience and you will enjoy low taxation, low cost accommodation, free terminal gratuity amounting to 25% of basic salary. Free passage for the person appointed and immediate family from place of recruitment to Zambia and back will also be provided.

For further information please send full personal/professional details (without obligation and in total confidence), indicating which position interests you, to: Recruiting Officer, Zambia High Commission, 7-11 Cavendish Place, London W1.

Unit view

Let's have the whole story, Robin Hood

What a sedate bunch those of us involved in education often are! The muted and rather technical responses to the Government's Expenditure White Paper have sounded more like resignation than resistance. It seems that we are afraid to make an emotional case of education in the same way that others would of nuclear proliferation or the tragedy of unemployment.

Yet expenditure decisions on the part of Government threatens most of the ideals and morality which have governed the expansion of higher and further education since the war. We can expect course closures and a drop in student intake, thus guaranteeing a diminution in opportunity to the next generation of 16-19 year olds.

Worsening staff/student ratios and cuts in library provision will certainly affect academic standards. Facilities for disabled students, nursery places that will allow parents to study and hardship funds for overseas students will all suffer. Should the Thatcher miracle actually take place, then we'd probably have to import skilled labour from the continent to deal with our booming industries. For short-term gain the long-term investment represented by educational expenditure is being given a real hammering, and most of us are sitting back too punch drunk to react.

What I'm saying is that we've utterly failed to make post-school education a major political issue in this country. Different interest groups have agitated about those decisions that have affected them most adversely, but have rarely taken a step back and looked at the whole picture. Polytechnic directors, deeply troubled over the last year by financial and administrative proposals concerning their colleges, have often spoken of the disparity in the

treatment given to their own sector and that meted out to the universities. Progressive educationalists have rightly drawn attention to the continuation of privilege and elitism that an over concentration of funds in the universities represents, and argued for a redistribution. Well, now you've got it - and much good may it do you. The Government only understands half of the Robin Hood principle - the taking away bit. Giving to the poor will have to wait until they are absolutely certain that every approach to Sherwood Forest is adequately defended. I'm not arguing for a defence of the status quo, what I'm saying is that all of us involved in education could quite usefully avoid sectionalist positions.

We've also got to accept, however, that higher education in particular

people all it means is their continued exclusion from the educational process. By not adopting a much more radical approach we offer a great deal of political ammunition to our critics.

Frankly it's not much use all of us just echoing our separate concerns for our own "patch". The CVCP can go on as much as it likes about research, the AUT about tenure, others about pay settlements or indeed NUS about grants and conditions. The cost of all these problems is clearly the national commitment (or lack of it) to put major resources into post-school education.

If we can't win that commitment then all these other areas of concern are not going to be resolved, and not just in the lifetime of this government. No, we're going to have to completely revise the way in which we talk about education, and to whom we talk.

At the national conference of NUS which starts this weekend, the agenda reflects the problems that students are beginning to encounter with major structural alterations to their institutions as a result of spending cuts. One resolution, down for debate, calls for the creation of the widest possible alliance to defend and extend education. Utilising the initiative of the TUC in circulating organisations asking them to participate in such an alliance, the resolution sees a need for organisations inside and outside post-school education to draw up a strategy for forcing education onto the political agenda.

NUS has already called round-table discussions between bodies involved in the public sector of higher education in part responses to recent government initiatives. But there is also immense scope for involving school children, teachers and others in local activities designed to overcome the demoralisation and hopelessness with which people view the prospect of overturning government policy, then we're bound to stumble from rationalisation to rationalisation to closure to disaster. So, whose for an alliance?

David Aaronovitch

The author is president of the National Union of Students.

Science in America

Weighing up a question of mass



Clive Cookson

The burning new question of the past year in theoretical physics has been whether the neutrino - famous for nearly 38 years as a 'ghost particle' with no mass - actually has a tiny mass after all. The answer will be of tremendous consequence not only for physics, particularly the theory of elementary particles, but also for cosmology.

Neutrinos are by far the most numerous particles in the universe; astrophysicists believe they outnumber the protons, neutrons and electrons that make up ordinary matter by 10 billion to one. So to give each one even an infinitesimal mass would revolutionize our ideas about the structure and perhaps the ultimate fate of the universe. Their combined gravity could be enough to stop the universe expanding eventually and pull it back together again - in cosmological shorthand, 'to close the universe'.

The excitement started last April when the dozen neutrino hunters, Frederick Reines of the University of California at Irvine, told the scientific press assembled at the meeting of the American Physical Society in Washington that he had evidence for neutrino mass. Working at a nuclear reactor in South Carolina, where Dr Reines and his colleague had first detected neutrinos 25 years ago, the physicists from Irvine found that the particles were 'oscillating' between two or three different states. A theoretical consequence of the oscillations was that the neutrinos must have mass.

At the same time word reached America of experiments in Moscow. Neutrino research turns out to be one field in which Soviet scientists are ahead of the Americans.

A team at the Institute of Theoretical and Experimental Physics in Moscow observed the radioactive decay of tritium which emits an anti-neutrino and an electron whose energy is so low that the impetus given it by the anti-neutrino should just be detectable - if the particle has mass. The Soviet measurements indicated that the anti-neutrino (and therefore the neutrino) has a mass of at least 14 electron-volts. That is more than one-50,000th of an electron's mass.

Since then other scientists have come forward with more indirect evidence. For example Floyd Stecker of NASA's Goddard Space Flight Centre has detected ultraviolet radiation which may arise from a 'cloud' of heavy neutrinos around our Milky Way Galaxy, undergoing very slow decay. However some physicists, such as

Felix Boehm of the California Institute of Technology, say none of the results so far has been sufficiently precise and reliable to convince them that neutrinos have mass. Over the coming year a new set of experiments will be taking place in America and Europe. In the hope of producing evidence that everyone will accept as conclusive.

The theoreticians are not waiting though. They are working on 'grand unified particle theories' which describe three fundamental forces (weak, strong and electromagnetic) in a single mathematical framework. Many of the theories predict a different mass for the three known types of neutrino. Experimental confirmation of this would help them weed out the theories.

Cosmologists have embraced massive neutrinos even more enthusiastically. They have been bothered for many years by the 'missing mass' in the universe; all the visible matter, including stars and gas, is far too light to account for the way galaxies move and interact. It is difficult to see how there could be enough conventional 'dark' material, cold gas, dust and rocks, to make up the difference. But neutrinos with mass of the order of 18 electron-volts, as suggested by the experimental evidence, could do the job perfectly.

They would do a lot else besides. Alexander Szalay, a Hungarian Astrophysicist, visited the United States for a recent symposium and explained how the present distribution of galaxies in the universe could have been determined by the way neutrinos 'clumped' together under the influence of their own gravity during the first 100,000 years after the Big Bang. Then, when ordinary matter formed out of the hot homogeneous plasma, it was pulled into the neutrino clumps.

As American astrophysicist David Schramm of the University of Chicago pointed out at the meeting, massive neutrinos are the last step in the Copernican revolution: man learned first that the earth was not the centre of the solar system, then that the sun was not the centre of the galaxy, then that the galaxy was not the centre of the universe. Finally he may have discovered that the particles he is made of are not the dominant matter of the universe.

Don's diary

Monday

On duty until 10 pm (the libraries are open 13 hours a day) but I have the evening at home with 16-month old William, while Jennifer takes our next to the ante-natal clinic. The university has a 50-place nursery, but only three places can be held for AUT members. I try to slip into the library unobserved so that I can prepare an on-line literature search for a group of animal physiologists. Their interests range from molybdenum to vitamin E and it took as long as the search will have to cover Chemical Abstracts as well as the Commonwealth Agricultural Bureaux' database. If it is successful we can give them regular updates by storing the search strategy in the computer, in California.

During the evening we have a steady stream of routine inquiries, nothing more complex than a request for a German atlas. Is it true that somebody once asked for a road map of the world? This is an opportunity to get ahead with book selection; buying new books is a particularly satisfying part of my work - as long as we have enough money. I am working through *The Bookfinder* (which I buy myself); this issue lists forthcoming books for the next six months. My responsibilities range from biophysics to psychology, and I take into account the reputation of the author, the importance of the subject and the current research interests and teaching commitments of the university as well as the relative price of bound and paperback editions.

Tuesday

I still miss the walk along the seafrost which took me to work in Aberystwyth, although I do walk to work now. Discussion in the staff room centres on the local rates, making comparisons with colleagues who commute from York, Bradford or Harrogate. Someone suggests coming in from Sheffield where the buses are so cheap. We calculate how much each of us is paying to have the dustbins emptied each week, and conclude that the public library service is certainly not 'free'. We depend heavily on Leeds City Libraries for commercial information, and entirely for patents, which are constantly required for applied scientists, in textiles or metallurgy, for instance.

Wednesday

Groups of sixth-formers are touring the campus, visiting departments, the students' union, and of course the libraries. Leeds has notable collections of old and rare books, such as the renowned Brotherton collection, and we also make special efforts to support undergraduate work with multiple copies of the recommended texts. These are available for one week loan, long enough for a student to prepare for a seminar, while the books in the main collections are available for longer periods when prolonged study is required. The automated issue system tells us how many times each book is borrowed, so that we can weed out titles that are not being read and put in extra copies of those for which we have waiting lists. The system breaks down when lecturers neglect to send their reading lists to the library.

This afternoon we have a series of students looking for a reprint - the journal is held in our medical library and the author has also sent four copies to the 'student' library, but his reading list does not give the co-author's name, under which we had unfortunately listed it. We also have a professor, refereeing a paper, trying to trace journals which have been cited merely by initials. Most appear to be east European and we spend some time guessing what AMS might stand for, before hitting on *Archivum Mechanici Silesiense*. If I was the editor, or the referee, I think I would have rejected the paper at this stage.

Thursday

Print-out arrives from Frascati for a computer-assisted literature search I did; one reference is to menstrual problems among ballet dancers and it is apparent that my search strategy was too broad. I arrange to repeat the search with the customer (this service is not free) present. This means a trip to the medical library, where we share a terminal and telephone link. I also have to fit in a visit to the Brotherton Library, flagship and administrative centre of the library system.

The librarian calls me into the Oval Office. I mention the apparently intractable problems in our building, of noise from the heating and air conditioning units and concrete dust coming off the walls, of heavy doors opening onto the main stairs, and the library assistants' wish to have soft loo paper.

Interviews have been taking place for next year's two graduate trainee posts. Some universities no longer take trainees, another is thought to consider only graduates with a first. The DES gives a number of bursaries for post-graduate training in librarianship, but the number of such grants has not yet been announced. A large proportion of newly qualified librarians will be seeking jobs in contracting, publicly funded area, schools, hospitals and so on, and those who hope to work in industrial libraries also face a shrinking employment base. This is supposed to be the dawn of the new age of informatics. Will somebody wake us up when it has arrived?

Friday

The university has recently installed two computer terminals in the science library, and we have become computer junkies. Several librarians are learning basic, and the computer service has produced a bibliographic software package for people who keep their personal indexes as computer files, instead of using edgemark cards, for information retrieval. I use this package to keep track of inter-library loans; I can tell in moments how many requests come from one reader, or any particular department. I can also tell when a particular title is in steady demand, in which case it could be cheaper to take out a subscription than to borrow copies from the British Library. The more we spend on inter-library loans, the less money there must be to buy books for our own collections.

We meet colleagues from the Brotherton Library for lunch at Leeds Playhouse (an excellent theatre, which is on the campus and the rates). This is an opportunity to exchange gossip, but as librarians we realise that information transfer is the name of the game, and it is a fruitful working lunch.

Saturday

The South Library is open during the weekend, and is particularly heavily used on Sunday afternoons. However I have already taken my turn on the rota this term - working on a Sunday means a 'wildcat' day off, taken to suit yourself and never mind the system. Library assistants are predominantly women, and do not command a breadwinner's salary. A man supporting a family on this money would surely qualify for supplementary benefits.

In the evening Leeds leisure services put on a concert in the magnificently renovated town hall. I note the director of Leeds Polytechnic in the third row, and quickly lose count of dons. Tomorrow there is the prospect of walking in the Dales. Yes, it's a don's life in Leeds.

Adrian Smith

The author is an assistant librarian in the South Library of the University of Leeds.

Help us to help ourselves

Laurie Taylor



I wonder if we might go over this once more, Dr Fogwith? As I understand it, what you're suggesting is that a 50-foot long banner bearing the legend "Congratulations Lady Diana" should be flown from the top of the physics block under lower.

Well I don't wish to be dogmatic on this point, sir. "Congratulations Lady Diana" is merely a suggestion. We could certainly go for something rather less formal. Perhaps "Well Done, Lady Di" or "Charlie is her darling".

Yes, yes, thank you Dr Fogwith. The point in question, as I see it, is not the actual legend - although on that subject the phrase "Congratulations Lady Diana" seems infinitely preferable to the alternatives - but rather the very existence of the banner itself. I accept this committee's view that it is an interesting idea in these straitened times to give the University's Open Day a royal wedding motif, but I believe there are important questions of taste still to be resolved.

But, sir, this is surely a most positive way in which to demonstrate the links between town and gown: to show that the University community shares the enthusiasm which has been aroused in the general population by this happy event, and thereby swell the growing support for our local "Save the Dons" campaign.

If that is our intention, Dr Fogwith, then surely you should have joined with me earlier in condemning the social science's determination to mount an exhibition entitled "Royalty and the Mythification of the Economic Crisis". And in particular that vulgar float of theirs, in which cardboard cut-outs of the prince and his bride are shown walking to the altar rails of St Paul's across a mass of prostrate bodies labelled "Three Million Unemployed". I think we have to be careful, sir, not to interfere with the autonomy of departments. Inevitably in an intellectual community such as this there will be differences in emphasis.

I must say, Dr Fogwith, that I'm beginning to find your manner a little offensive. This is a university and not a holiday camp. Consideration of 'taste' may seem irrelevant to you and some of your colleagues, but I believe them to be a mark of a civilized community such as ours.

If I may say so, sir, that is profoundly conservative.

I'm sorry, Fogwith. But I feel I have compromised enough already. As you know I have expressed great enthusiasm for many aspects of the plans for this Open Day - the Chemistry Department's excellent proposal for a fireworks display on the library roof, the Biologists' most interesting idea of a working model which demonstrates the intermingling of royal blood through the ages, and of course the Competition of the Royal Wedding Dress. And as you know, no objections were raised other than absolute. It just seemed that a department of such diverse talents was liable to do something less than justice to itself by restricting the Royal Open Day offering to an exhibition entitled "Romantic Agency, the novels of Barbara Cartland". But all that is past. We must now address ourselves to the present. Would anyone, I wonder, be prepared to settle for a 20-foot banner?

LETTERS TO THE EDITOR

University stereotyping must not go unchallenged

Sir, - It is disappointing to find you of all people falling into the trap of over-simplification of the university system by type-casting into separate divisions the larger, urban and the so-called "green fields" universities. The implication of your editorial (March 13) was that the concentration of research funding which you allege has already happened in the natural sciences and you think is evident in the social sciences will lead to a greater differentiation between universities, the "green fields" universities coming to be equated with American liberal arts colleges. You have the grace to say there will be many exceptions in both camps but I think it is important that such stereotyping of institutions should not be allowed to remain unchallenged.

There is no perfect measure of research standing between institutions but one comparator which is sometimes used (despite its obvious inadequacies) is the ratio of non-UGC expenditure per member of academic staff by subject group and university. No one would necessarily regard this as

a measure of quality but since concentration of research funding appears to be the basis for your stereotyping it is perhaps worth using this measure to see how the "green fields" universities, which I take to mean the wholly 'new' universities of the early 1960s, compare with the rest. The 1978-79 UGC Form 3 returns show that in biological sciences, Warwick headed the list with York fourth, Kent fifth and Sussex sixth. In engineering, which only a minority of the 'new' universities were permitted to establish, Warwick was third place and Sussex sixth. In mathematics, which also includes computer science, York ranks fourth, Sussex fifth and Essex tenth. In physical sciences, Sussex is sixth, East Anglia eighth and Warwick tenth. In business management studies, which only one of the 'new' universities took up, Warwick is third and in education Sussex is first, Lancaster second and Stirling third.

Perhaps the best measure of the social sciences lies in the award of SSRC studentships. Here the position of the "green fields" universities can

perhaps best be gauged by the fact that in the SSRC's 1980 allocations they captured 20 per cent of the studentships available (although their staff represented only about 14 per cent of the staff in these fields in the university system as a whole). In the particular subjects covered by SSRC, Lancaster gained the second highest number of awards in economic and social history, and was equal third in education. In economics Warwick was third, after LSE and Oxford, with Sussex fifth and Essex sixth. In management and industrial relations Warwick came third after the London and Manchester Business Schools, while in politics and international relations Essex came second after LSE. In sociology and social administration, Essex and Warwick came joint second with Oxford and Cambridge, with LSE coming first.

My purpose in writing is not to say that research funding or studentship awards are necessarily effective measures of research quality but to make the point that generalizations about institutions' standing in relation to

their type or age of foundation are very dangerous. What I hope I have shown is that on any comparison of the kind you have suggested the 'new' universities come out well and there is evidence to support their assignment to a liberal arts role in any future higher education scenario. If higher education has to be slanted down to meet the needs of these kinds of criteria, and the quality of a level entry, are taken into account when decisions are taken as to funding degree level work and research on the two sides of the binary line, within the university system we should be encouraging the UGC, if it is embarking on a *divine* policy, to pay regard to evidence of research quality, and not to national need or to any notions which depend on categorisation of institutions into crude characteristics like "larger urban" or "green fields".

Yours faithfully,

M. L. SHATTOCK
academic registrar,
University of Warwick.

CNAIA visit to South Bank Polytechnic

Sir, - As senior academics in the polytechnic we are very concerned that excerpts from the report of the CNAIA institutional review visit to this polytechnic (*THE TIMES*, February 20) appear to have been selected in a way which not only gives a somewhat biased account of it, but also fails to recognise the unusual circumstances under which the visit took place.

Your news item asserts that the report is damaging but that it does "avoid direct criticism of academic standards". In fact the opening sentence of the report refers to "the high quality of many of the courses being conducted by the polytechnic and the substantial progress evident in many areas since the previous institutional review". It is in this context that it then criticises certain "interrelated structural and organisational factors which have retarded development".

The circumstances surrounding the review visit last October are as follows: the polytechnic began its search for a replacement for Mr Pereira-Mendoza early in 1979 and Dr Beishon, his successor, took up post in April 1980. The deputy director, John Bellamy, also retired in December 1980.

The CNAIA visit should have taken place in 1979 but at the request of the polytechnic, was deferred pending the appointment of the new director. The visit was then arranged for May 1980 but was again postponed, until October, due to the "Day of Action". Thus the twice-postponed CNAIA review visit eventually took place about 18 months after Mr Mendoza had decided to retire, six months after his successor took up office and with the deputy

director a few weeks from retirement.

The retiring director was well aware of the need for some reorganisation of the polytechnic as a result of the internal and external changes and developments which were affecting the whole tertiary sector. He was, however, determined not to foreclose the options open to his successor and which he felt would increase rather than reduce possible future developments. To suggest a "standstill in all initiatives from 1978 to 1980" is quite incorrect and is not what the CNAIA report says.

The decision to leave options open did however mean that certain long term developments on committee structures and faculty and academic board policy were not pursued as forcefully as they would have been had Mr Mendoza not decided to retire. It was this "state of flux" or "reappraisal and transition" which was recognised by the CNAIA visiting party and is referred to in their report.

With regard to the specific six areas of positive criticism taken from the report and listed in your article, the first, the separation of academic from decision making leadership, is not what the report says nor - in our experience - is it a view which the CNAIA is likely to endorse. The second and third points of criticism relate to the current proposals to reorganise faculty structures and the need to redefine roles to match new structures and organisation.

The fourth and fifth points concern communication and relationships between staff, students and the academic

board. These will certainly be considered very seriously.

The final point concerns support services provided by the ILEA including administrative staff and funds for equipment. The polytechnic has for some years been pressing these points with the ILEA and welcomes the additional support for its case which is now being given by the CNAIA.

The Polytechnic of the South Bank is committed to the CNAIA and recognises the importance and value of that body's external, objective and detailed assessment; its views are to be taken seriously. However, the dialogue between the CNAIA and this polytechnic will start in earnest when the academic board considers the report and it will involve all staff. The premature publication of an inaccurate account by *THE TIMES* will add very little to the constructive debate which we are sure this polytechnic - and the CNAIA - desire to establish and which will be part of the broader issue of relationship between the CNAIA and the polytechnics in the development of the partnership in validation exercise.

Yours faithfully,

MARY CROWTHER, Dean of Faculty of Education, Human and Social Studies
DOUGLAS HYKIN, Assistant Director, Borough Road Site
MAXWELL SMITH, Assistant Director, Wandsworth Road Site
JOHN SLANEY, Dean of Faculty of the Built Environment
BERNARD WELLER, Dean of Faculty of Science and Engineering, Polytechnic of the South Bank

I have also researched the council's minutes over a considerable period and the only reference, which I can find is a resolution addressed to the governors requiring them to ensure that the polytechnic operates correctly within the terms of the articles of government and of the financial rules.

In these circumstances, it is difficult for the non-teaching staff of the Institution to reconcile the various statements made with the comments in your article, but, then, of course, you may have access to sources of information, not available to us. If not, then your strictures on an institution in which we are proud to work may have caused considerable damage not merely to morale but to our prospects of continued employment.

Yours faithfully,

J. T. BLACKWOOD
The Fairway
Huddersfield

Sir, - The arguments for more research studentships, put forward in the letter from the Centre for the Study of Social History in Warwick (*THE TIMES*, February 27) are widely accepted by academics. Research has to compete for funds both with other uses of public funds and with the taxpayer's understandable preference for spending the money. The cheap achievement of research results by research students

which they can see as a case for more studentships, is seen by students as a case for paying them a salary.

Yours faithfully,
ERNEST RUDD
University of Essex

Letters for publication should arrive on Tuesday morning at the latest. They should be as short as possible and should be written on one side of the paper only. The editor reserves the right to cut or amend them, if necessary.

Laurie Taylor is a man with glasses and a beard, wearing a suit and tie.

Journalism
Sir, - Mr Scott is correct in his letter (*THE TIMES*, March 6) in stating that the University of London diploma for Journalism became concentrated at King's College London from the beginning of session 1938-39. The course was very popular and that session it had 60 first year and 45 second year students. But that was its last session for, with the outbreak of war and the evacuation of the college to Bletchley, the course was suspended. When the college returned to London in 1943 the course was not re-instituted owing to lack of student accommodation and staff. Discussions were carried on until at least 1946 but no satisfactory

Yours faithfully,
IAN ANGUS
Librarian, King's College London.

Australia's standards
Sir, - The headline "Australia's standards plunge" (*THE TIMES*, February 20) is grossly misleading. It may be true that applications were down by 15 per cent in New South Wales; it is certainly true that they were up by 6.3 per cent in Queensland. One state does not a

Yours faithfully,
F. J. WILLETT
Vice-chancellor
Griffith University
Queensland, Australia

Scientific criticism
Sir, - I wish to point out that Michael Woolf's letter (*THE TIMES*, March 20) consisted mainly of fallacies, misstatements, simple critical complacency. The whole letter is symptomatic of the continuing survival of the ideologically bankrupt notion of the liberal humanist, the leisured, "cultured" man of letters who no more needs a course in how to criticize than he does a course in how to read; his only obligation as a critic is to be "sensitive" and "humane".

Consequently, Woolf recoils from "scientificism" because it threatens to usurp his values. He fails to see that an attempt to make criticism more scientific is essential if the critic is to justify himself. All scholarship is a search for truth, or it is worthless. "Scientificism" is an attempt to give criticism a greater degree of rigour and objectivity, to give a traditionally *ad hoc* area of study a much needed backbone.

To think that "the best criticism now works of art as a means to produce another work of art" is sheer nonsense. Woolf may as well say in clear English that there is no difference between art and criticism, thereby making the fallacy obvious. If a critical work is as much "art" as the art it criticizes, then it can possibly be said to "criticize" a work of criticism. "Independent from the works it discusses"? No critic wants to be so "elegant" of some vague notion of the "elegance" of "art". The inseparability of form from content applies to criticism as well as to art. The critic must say something if he is to justify himself; if what he says is invalid, no amount of "grand style" can vindicate him. Woolf may be happy to look at 18th-century *Leviathan* in terms of style; I am not. I merely in terms of style; I am not. I merely in terms of style; I am not.



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Salary strategy for the 1980s

The foreboding about the future financial condition of the universities provoked by the latest public expenditure White Paper has overshadowed the meanness of the salary increases awarded to university teachers two weeks before and now reluctantly accepted by the Association of University Teachers. A seven per cent increase from last October, a further three per cent increase from this month, and the postponement of the date of the next settlement until April 1982 do not add up to equitable treatment even by the meagre moral standards of industrial relations in contemporary Britain.

The three unhappy outcomes are that university lecturers have suffered a substantial cut in their real standard of living at a time when many groups of workers have been able to keep wage increases in front of or equal to price rises, the creation of a new and probably more intractable "anomaly" because the AUT increase is well below the analogous increase won by Naffie for polytechnic and college lecturers almost a year ago, and the final breaking of the myth that the appropriate salary comparison should be with the senior scientific civil service (senior administrators left university teachers pounds behind years ago), not with college and school teachers. We are all, it seems, teachers now.

Two arguments may possibly be suggested to soften the blow. The first, and less important, is that the depressingly low settlement was the result of negotiating miscalculations by the leaders of the AUT, rather than a sign of the contemporary status of universities and of those who teach in them. It will be said that last autumn anyone with reasonable foresight could have seen that size of pay settlements was likely to decline once the Government had announced its 6 per cent cryo-incomes policy and the deepening recession had begun to influence negotiating expectations. According to such critics the AUT should have settled as quickly as possible after it became obvious that university teachers could no longer hope to be treated as a special case at the tail end of the Clegg round of public sector pay rises.

It is not necessary to believe in the political acumen of the AUT's leaders to regard such criticism as misplaced. With hindsight it may be easy to see that the AUT should have tried to extract a specific promise from the Government that they should not be treated less favourably than their National colleagues, as their price for agreeing to be removed from the Clegg exercise. But at the time the best policy seemed to be to put as much distance as possible between their current claim and the death-row shambles of Clegg.

In any case there is no evidence that a slightly larger increase last October would have been acceptable to university teachers at that time. Indeed it can be argued that six months of semi-deliberate deadlock were necessary to educate the rank and file of the AUT to accept a low settlement which had been almost inevitable since last

September. A gloomy winter was required to lower their expectations, together with the bribe of a substantial accumulation of back pay whatever the increase, the oldest trick in the trade union negotiator's book when having to face his members with a disappointing settlement. In any case it was the DES, not the AUT or the Universities Authorities Panel which delayed an earlier settlement.

The second mitigating argument is more substantial: it is that if university teachers had done better, universities as institutions would have done even worse. In fact the relationship between the financial condition of the universities and the pay of university teachers is more ambiguous. On the surface and in the short term the correlation may appear to be as negative as this second argument suggests. It is certainly true that a more generous salary increase would have put the universities under even more intense financial pressure. In such a labour intensive industry it could not be otherwise. For the same reason the suggestions by Mr Sapper, the AUT's general secretary, that redundancies should be avoided at all costs by raiding the equipment grant, meagre as it is, and by lowering the age of early retirement to 50 should be treated with great caution. The first, although feasible, is undesirable; the second, although desirable, is not feasible.

However, if a slightly broader view is taken of the relationship between university finances and low academic pay, it will be seen that both are part of the same process, the decline in the public esteem of the universities combined with the undermining of the post-war welfare state. So any improvement in the financial condition of the universities achieved by lowering the real pay of university teachers is likely to be brief and flimsy.

It is as great a mistake for a vice chancellor to imagine that his university could be strengthened financially if only his academic staff were paid less, as it is for Mr Sapper to argue that academic redundancies must be avoided by cutting non-staff expenditure however important. The only substantial way to reverse the downward trend in the value of both the university grant and of university teachers' pay is for universities to win back their former priority in public expenditure or, if that is impossible, to extract a specific promise from the Government that they should not be treated less favourably than their National colleagues, as their price for agreeing to be removed from the Clegg exercise. But at the time the best policy seemed to be to put as much distance as possible between their current claim and the death-row shambles of Clegg.

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Sir Keith and Sir Monty

When Sir Monty Finniston's committee of inquiry published its report on the future of engineering more than a year ago, Sir Joseph, the Secretary of State for Industry, promised that the Government would respond with "speed and sobriety". Most detached observers would argue that he had been far too little speed and far too much sobriety about the Government's demagogic response to Finniston that it emerged in the past 14 months. The Department of Industry is still dithering while the engineering institutions - the work of the problem in the eyes of many qualified critics - squabble over representation on the proposed engineering authority.

Now Sir Monty himself has entered the argument again. He believes that Sir Keith's compromise plan for a chartered (and fairly toothless) authority should be rejected. Instead he has demanded a ballot of all institutions members who, he believes and hopes, would support his own proposal for a statutory, and therefore powerful, authority. He is right to do so. The whole thrust of his authority is to take power from the running of the profession and put an end to the infighting and special pleading of interest groups.

The transition committee made one overall recommendation - the creation of a strong authority to implement the other 79 recommendations made in their report. It is its keystone. So it is difficult to understand Sir Keith's refusal to accept this central recommendation and instead to play around with woolly and confused compromises.

In the last few months he has paid out thousands of millions of public money to bail out companies such as British Steel and British Leyland to rescue failure, untidied critics might suggest. Yet he appears strangely unwilling to invest a small sum of money, £10m, in possible success by establishing an engineering authority which stood a fair chance of continuing to do its job in the British industry.

Nothing could be more depressing than for a reform designed in part to heal the British disease falling victim itself to this enervating germ.

Yours faithfully,
PETER CORBETT
University of Sussex

Suspending Chomsky's disbeliefs



Steven Lukes

In the *THES* (November 7) I accused Noam Chomsky of "contributing to deceit and distortion surrounding Pol Pot's regime" in his book with E.S. Herman, *The Cambuch* (1979). He asserts (*THES*, March 6) that my case is based on "fabrications" and "gross errors of reasoning". Let us see.

Chomsky claims that Herman and he were exclusively concerned with demonstrating the "systematic bias" in the Western media and that they did not give their "views" concerning the Pol Pot regime. But this is untrue, as any reader of the book can attest. It advanced a clear thesis about what it was plausible to believe had happened in Pol Pot's Cambodia. That thesis goes well beyond the self-evident truths that the US bombing was one major precondition for what occurred and that "peasant revenge" may be one factor, alongside of many others, in accounting for postwar deaths and killings. It asserts that Pol Pot's regime was "simply forcing the urban population to the countryside where they were compelled to live the lives of poor peasants, now organized in a decentralized system of communes", that it enjoyed widespread peasant support, and that "the deaths in Cambodia were not the result of systematic slaughter and starvation organized by the state but rather attributable in large measure to peasant revenge, undisciplined military units out of government control, starvation and disease that are direct consequences of the US war, or other such factors". This is not just my reading of their books. A reviewer highly sympathetic to them and sharply critical of me (in *Kampuchea Bulletin*, Jan/Feb 1981) takes them to have argued "that the available evidence suggests that the majority of the killings were not centrally ordered and were most likely personal and unofficial settling of accounts by peasants".

Chomsky and Herman contrasted this thesis with that "to which the propaganda machine is committed: that the Khmer Rouge leadership was committed to systematic massacre and starvation of the population it held in its grip", complaining that it "became virtually a matter of dogma in the West that the regime was the very incarnation of evil with no redeeming qualities". Their thesis, in short, was the basis on which they made their case for systematic bias in the media, (engaged in "engineering consent to the priorities and structures of contemporary state capitalism"). To establish it they attacked the credibility of those recording refugee testimony that refuted it.

They wrote: "Most of the well publicized information concerning postwar Cambodia derives from reports of refugees - or, by extension, from accounts by journalists and others of what refugees are alleged to have said. On the basis of such reports, these observers draw conclusions about the scale and character of atrocities committed in Cambodia, conclusions which are then circulated (often modified) in the press or the halls of Congress. For example, Barron Paul presents some examples of what they claim to have heard from refugees and then concludes that the government of Cambodia is bent on genocide, a conclusion which is then presented in various forms by commentators. Similarly Ponchaud cites examples of refugee reports and concludes that the

government is engaged in "the assassination of a people", giving estimates of the numbers executed or otherwise victims of centralized government policies. Reviewers and other commentators then inform the public that Ponchaud has shown that the Cambodian government, with its policies of autogenocide, is on a par with the Nazis, perhaps worse".

But they completely fail to discredit the evidence these authors have amassed. William Shawcross has written that the interviews conducted by Paul (of Barron Paul) "seemed carefully done. Paul recorded a great many horror stories about the forced march from Phnom Penh; the appalling rigours of life in the new work camps; the destruction of all traditional social relationships, including the family; the use of murder, as a means of control". He considers these stories have a consistency that, even allowing for the natural tendencies of refugees to exaggerate, confirms their basic truth. Father Francois Ponchaud, the author of *Cambodge Année Zéro*, and probably the man who has made the most thorough study of the refugees from democratic Kampuchea, agrees with him. So do I.

Chomsky chose (and still chooses) to discount much of this evidence, arguing that "the apparent uniformity of refugee testimony is in part at least an artefact reflecting media bias". The only appropriate response is Ponchaud's: "... it is surprising to see that 'experts' who have spoken to few if any of the Khmer refugees should reject their very significant place in any study of modern Cambodia. These experts would rather base their arguments on reasoning: if something seems impossible to their personal logic, then it doesn't exist."

What then of the sources on which Chomsky does rely? Chomsky and Herman clearly endorsed Ben Kiernan's questioning "the assumption that there was central direction for atrocities" and that they extended throughout the country. But Kiernan now writes "I was late in realizing the extent of the tragedy in Kampuchea after 1975 and Pol Pot's responsibility for it" and that there is "a left wing argument - still held, apparently by Noam Chomsky - which suggests that, although Pol Pot made numerous brutal errors, the assumption of something else going on, that the regime was a chimera bred up by the Western (and Vietnamese) news media". Michael Leifer (*THES*, January 28) has quoted the clear acknowledgements by Kiernan and Stephen Heder (on whom Chomsky also relied) of the Pol Pot regime's "systematic use of violence" and "relentless use of terror". Chomsky's only reaction is to observe that these statements postdate his book.

In his *THES* reply, Chomsky also cites "Nayan Chanda, the highly regarded correspondent of the *Far Eastern Economic Review*", as giving a low estimate of the number of atrocities. But Chanda has recently written of "this land which Pol Pot's killer squads turned into a country of orphans, widows and mass graves", where "each village seems to have its local Auschwitz" and ("the overriding emotion of the Khmers... is a fear that the brutal Pol Pot regime will return"). He writes that under Pol Pot, "the killing seems to have been part of an overall genocidal policy, but often to have been mindless slaughter by a regime gone mad".

Chomsky also cites Milton Osborne to support his thesis about the effects of US bombing. But Osborne has recently written that the numbers (in his sample) killed by order of the authorities were staggering and observed: "What happened in Kampuchea went so far beyond the paying off of old scores that an observer ends by reaching an impasse in searching for any overall explanation for such a descent into savagery." Part of the explanation, he suggests, lies in "an absolute determination on the part of the Khmer Rouge leadership to erase the past".

The facts are coming in, and "the more extreme condemnations" are being proved correct. But Chomsky claimed and claims that this should "in no way alter the conclusions we have reached". His argument, presumably, is that it was more plausible to disbelieve what has now turned out to be true. But what is it now plausible to think about Pol Pot's Cambodia? The writers cited above, on whom Chomsky has relied, are in no doubt. Is Chomsky?